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MATERIA MEDICA AND
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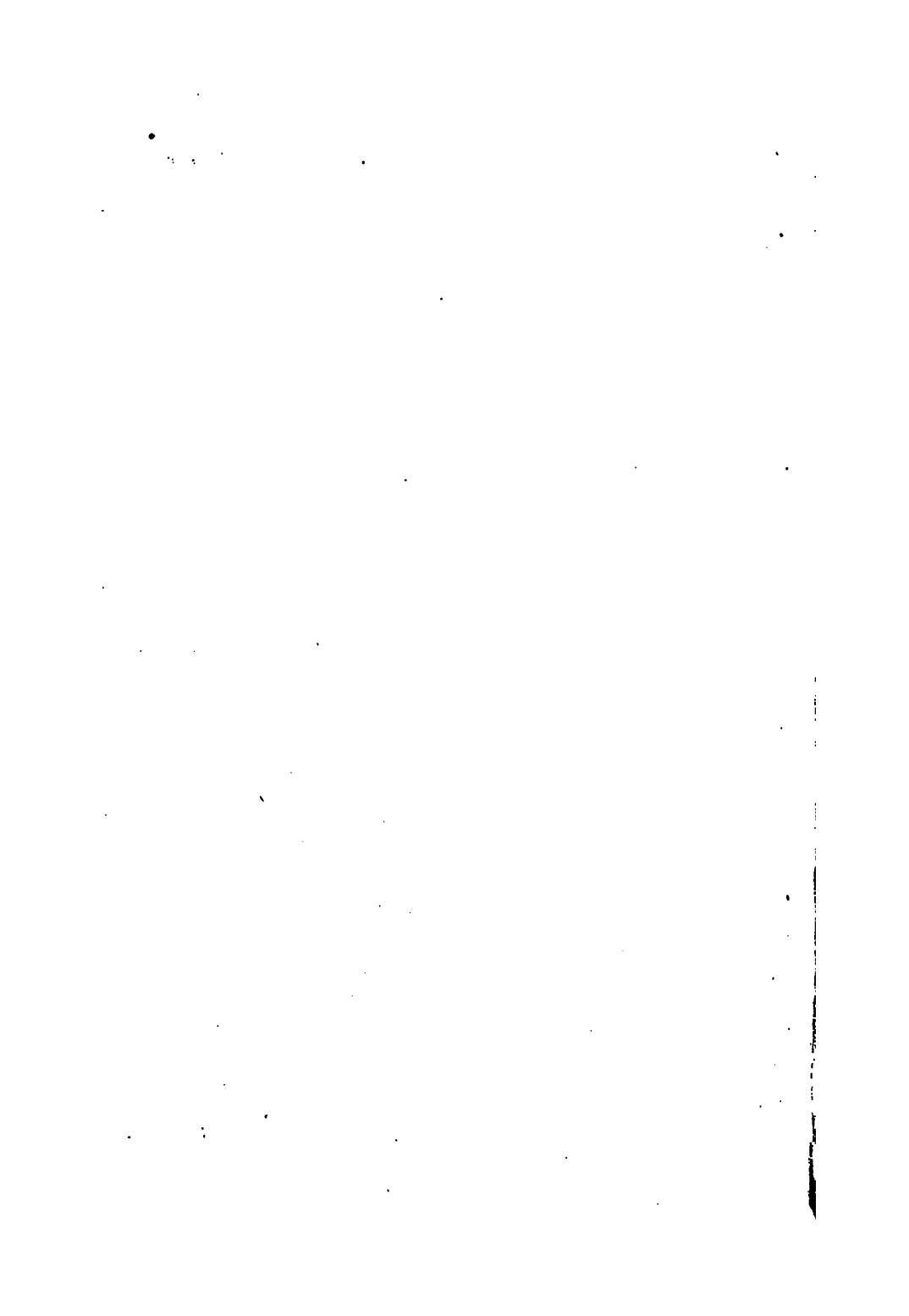
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Therapeutics (new)



THE ESSENTIALS
OF
MATERIA MEDICA AND
THERAPEUTICS
FOR NURSES

BY
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1910

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PREFACE.



THIS little work is intended to simplify the study of therapeutics for nurses by limiting the number of important remedies to be studied and appending a reference list to cover the other frequently used drugs and preparations. The physiological action described in the second part is based on experimental pharmacology, and is, therefore, not in conflict with the therapeutic applications of the remedies considered. In the reference table, the "Pharmacopœia," "Merck's Index," "The Manual of Therapeutics, Relating Especially to Biological Products," and various other sources have been freely used to make a suitable list.

The more ambitious text-books for nurses are based on a classification according to chemical and botanical groups. This, it seems to me, is needless, and imposes upon the student the task of culling the necessary knowledge from a confusing mass of facts. For this reason the author has considered a list of drugs, necessarily limited, in his lectures to students of medicine and nursing, and these lecture notes have furnished a

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basis for the present work. Special attention has been given to the untoward action of drugs, to aid the nurse in noting and recording these actions when they occur. Acknowledgment is due to Dr. R. M. Le Comte for assistance in preparing the manuscript, and to the Sister Superintendent of Nurses of Providence Hospital Training School for suggestions as to the scope of the work.

J. F.

CONTENTS.

PART I.		PAGE
DEFINITIONS, WEIGHTS AND DOSAGE.....	9	
PART II.		
HOW MEDICINES ACT	23	
PART III.		
IMPORTANT DRUGS AND MEDICINES	31	
PART IV.		
HYPODERMATIC AND RECTAL MEDICATION.....	107	
PART V.		
A REFERENCE LIST OF COMMONLY USED DRUGS, CHEMICALS, PROPRIETARY MEDICINES	114	
PART VI.		
THERAPEUTIC DEFINITIONS	185	

MATERIA MEDICA AND THERAPEUTICS.



PART I.

DEFINITIONS, WEIGHTS AND DOSAGE.

DEFINITIONS.

MATERIA MEDICA (medical material) treats of the natural and commercial history of drugs, their physical and chemical properties, and their doses.

THERAPEUTICS treats of the action of medicines in relieving or curing disease.

A **REMEDY** is an agency used in the treatment of disease.

A **MEDICINE** is any substance used in the treatment of disease.

A **DRUG** is any raw material used to compose or compound a medicine. (A **REMEDY** may be a drug, a medicine, or an agency such as electricity, sunshine, or bathing.)

A **PRESCRIPTION** is a written order for a remedy addressed to a pharmacist. (In a prescription the sign *R*, an abbreviation of the Latin *recipe* (*take*), appears first, followed by the names of the ingredients written in Latin and the quantities expressed in a standard system of weights and

measures. The directions to the pharmacist are also written in Latin. The directions to the patient are written in English or the language the patient speaks.)

PHARMACY treats of the preparation of drugs and medicines so that they may be most efficacious and least disagreeable.

The PHARMACOPŒIA is a book compiled by authorities in medicine and pharmacy as a national standard for the purity and accuracy of drugs and medicines. The book gives names and descriptions of crude drugs, tests for purity, and doses and formulæ for certain standard *preparations*. Drugs and preparations included in the Pharmacopœia are said to be "official."

COMMONLY USED PREPARATIONS OF THE PHARMACOPŒIA.

WATERS (AQUÆ) are weak solutions of volatile substances (as oil of peppermint) in water. They are used principally as flavoring agents.

SOLUTIONS (LIQUORES) are powerful solutions of non-volatile substances (chemicals such as arsenic, chloride of iron, etc.) in water. They are usually potent remedies.

SYRUPS (SYRUP) are solutions of sugar in water, usually with medicinal substances added (as syrup of tar).

SPIRITS (SPIRITI) are solutions of volatile substances (camphor, oil of peppermint, etc.) in alcohol.

ELIXIRS (ELIXIRES) are sweetened aromatic preparations containing alcohol and other medicinal substances.

MIXTURES (MISTURÆ) are watery preparations containing finely divided solid matter, not dissolved but in suspension.

EMULSIONS (EMULSÆ) are milk-like preparations in which oily matter is held in suspension by the aid of some viscid substance.

INFUSIONS (INFUSÆ) are preparations made by extracting the properties of vegetable drugs with hot water. Example—tea.

TINCTURES (TINCTURÆ) are preparations of vegetable drugs, not weaker than 10 per cent., made by extracting the properties of the drug with an alcoholic liquid.

FLUIDEXTRACTS (FLUIDEXTRACTA) resemble tinctures but are of 100 per cent. strength.

EXTRACTS (EXTRACTA) are made like fluid-extracts, but the alcoholic medium has been evaporated so that the product is a solid or semi-solid mass.

POWDERS (PULVERES) are mixtures of powdered drugs intended for internal use. Example—Seidlitz powders.

PILLS, CAPSULES, TABLETS, CACHETS, etc., are various devices for giving single doses of solid drugs in an acceptable form.

SUPPOSITORIES are suitably-shaped medicated solids, which melt at the body tempera-

ture, intended to be inserted into the rectum or other apertures of the body.

OINTMENTS (UNGUENTA) are fatty medicated substances which melt at body temperature, intended principally for local action.

LINIMENTS (LINIMENTA) are oily liquids for external use, to be applied with friction.

PLASTERS (EMPLASTRA) are semisolid medicated substances, spread on a fabric, which adhere to the body at the body temperature.

WEIGHTS AND MEASURES.

Two systems of weights and measures are employed by physicians and pharmacists. The old or apothecaries' system is best known and most generally employed in English-speaking countries. The metric or decimal system, corresponding to our system of currency, has many advantages, and is employed in the Pharmacopœia and generally used in Europe.

Each system has a *unit*, and this *unit* is the starting point or quantity in each system, which, *when multiplied or divided*, gives the *greater or lesser quantities or weights* of that system. The *unit* of the apothecaries' system is the *grain*; of the metric system, the *gramme*.

APOTHECARIES' WEIGHT AND MEASURE.

In this system the unit of weight is the *grain*; the unit of capacity is the *minim*. Certain

symbols are used to designate the various quantities. The *minim* of water at ordinary temperatures weighs *one grain*.

The *symbol* of the *grain* is *gr.* The *symbol* of the *minim* is m .

APOTHECARIES' WEIGHT.

Twenty grains make one scruple.

gr.xx = $\mathfrak{z}\text{i}$

Three scruples make one drachm.

$\mathfrak{z}\text{iii}$ = $\mathfrak{z}\text{i}$

Eight drachms make one ounce.

$\mathfrak{z}\text{viii}$ = $\mathfrak{z}\text{i}$

Twelve ounces make one pound.*

$\mathfrak{z}\text{xii}$ = lb.i

APOTHECARIES' MEASURE.

Sixty minims make one fluidrachm.

mlx = $\mathfrak{z}\text{i}$ or fl. $\mathfrak{z}\text{i}$

Eight fluidrachms make one fluidounce.

$\mathfrak{z}\text{viii}$ = $\mathfrak{z}\text{i}$

Sixteen fluidounces make one pint.

$\mathfrak{z}\text{xvi}$ = Oi

Thus it will be seen that, omitting the scruple and the pint, the quantities and the symbols are the same in both the apothecaries' weight and measure. An ordinary *drop of water* at 60° F. temperature is about *one minim*. The symbol

* The pound is seldom used.

gtt. (abbreviation of *gutta*) indicates the *drop*. The drop does not correspond to the minim in fluids heavier or lighter than water. The abbreviation *ss* means *one half*. Thus, *gr. vss* reads grains five and a half.

It will be observed that in this system the quantities are written in Roman numerals, as on a clock dial. Also that the symbol is written before the quantity—as *gr. xviii*, not *18 gr.* In the metric system this condition of affairs is reversed.

THE METRIC SYSTEM.

In this system the unit of *capacity*, for all practical purposes, is the *cubic centimetre (c.c.)*; the unit of *weight*, the *gramme (Gm.)*. In the metric system, however, the unit of length is the *metre*, a measure a little greater than *thirty-nine inches*. In multiplying this unit, we simply say, one, ten, or several hundred metres (abbreviation *M.*), writing the symbol *AFTER* the quantity. When a thousand metres is reached we call it a *kilometre* or *kilo*, and we multiply all the other units,—grammes and cubic centimetres,—in the same manner.

In *dividing* the *metre*, and, likewise, all the other units of the metric system, we do so by *decimals*, in the *tenths*, *hundredths*, or *thousandths*. For example, in the old system we may write " $\frac{1}{16}$ of an inch," or "*gr. $\frac{1}{4}$* " if it be a fraction

of the unit of weight. In the metric system we write

- 1 M. (metre).
- 0.1 M. would be read 1 decimetre.
- 0.01 M. would be read 1 centimetre.
- 0.001 M. would be read 1 millimetre.

It will be easily seen that 0.1 M. is 10 centimetres or 100 millimetres. The centimetre, the measure most used, is roughly $\frac{1}{2}$ of an inch.

To make this plainer, let us take our currency system. The dollar is the unit. Supposing we have \$1.25. We would read one dollar and twenty-five cents, not one dollar and 250 mills or one dollar two dimes and five cents. And, so, if for dollars we substitute metres, grammes or cubic centimetres (the units of measure, weight, and capacity of the metric system) we would read "one metre and twenty-five centimetres," or "one gramme and twenty-five centigrammes," or "one and twenty-five hundredths cubic centimetres."

So it is sufficient to remember that:

$$1000 \left\{ \begin{array}{c} \text{metres} \\ \text{or} \\ \text{grammes} \end{array} \right\} \text{make a kilo-} \left\{ \begin{array}{c} \text{metre} \\ \text{or} \\ \text{gramme.} \end{array} \right.$$

1000 cubic centimetres make a litre.

That

$\frac{1}{10}$, $\frac{1}{100}$, and $\frac{1}{1000}$ of a $\left\{ \begin{array}{c} \text{metre} \\ \text{or} \\ \text{gramme} \end{array} \right\}$ is one $\left\{ \begin{array}{c} \text{decí-} \\ \text{centi-} \\ \text{milli-} \end{array} \right\}$ $\left\{ \begin{array}{c} \text{metre} \\ \text{or} \\ \text{gramme} \end{array} \right\}$

$\left. \begin{array}{l} \frac{1}{10} \\ \frac{1}{100} \\ \frac{1}{1000} \end{array} \right\}$ of a cubic centimetre are read as if

they were written in fractions; *i.e.*, not "a decicubic centimetre" but " $\frac{1}{10}$ of a cubic centimetre," etc.

TO CONVERT WEIGHTS OF THE APOTHECARIES' SYSTEM
INTO THE METRIC SYSTEM.

I. *Multiply the quantity of grains or minims by 0.06 to give Gm. or c.c.*

II. *Multiply the number of fluid or liquid drachms by 4 to give Gm. or c.c.*

III. *Multiply the number of ounces by 30 to give Gm. or c.c.*

Examples.—How many Gm. in gr. x of Dover's powder? Rule I.— $0.06 \times 10 = .6$ Gm.

How many c.c. in fl. ℥x of paregoric? Rule II.— $4 \times 10 = 40$ c.c.

How many c.c. in ℥ii of alcohol? Rule III.— $30 \times 2 = 60$ c.c.

DEFINITIONS, WEIGHTS AND DOSAGE. 17

TO CONVERT THE METRIC SYSTEM INTO THE OLD SYSTEM.

I. *Multiply decimals of three figures (as milligrammes) by $\frac{1}{10}$ to obtain grains or minims.*

II. *Multiply grammes, cubic centimetres and their decimals by 15 to obtain grains or minims.*

III. *Divide grammes, cubic centimetres and their decimals by 4 to obtain drachms, fluid or solid.*

IV. *Multiply litres by 2.1 to obtain pints.*

Examples.—A physician writes, “Morphine sulphate, .006 Gm.” What part of a grain is this? Rule I.— 0.006 is six milligrammes; $6 \times \frac{1}{10} = \frac{6}{10}$ or gr. $\frac{3}{5}$.

Spiritus Ammoniae Aromatici, 1.2 c.c. How many minims is this? Rule II.— $1.2 \times 15 = 18$ minims.

Sugar of milk, 16 Gm. How many drachms is this? Rule III.— $16 \div 4 = 4$ or ʒiv .

A patient is directed to take five litres of milk a week. How many pints? Rule IV.— $2.1 \times 5 = 10.5$ or Oxss.

DOMESTIC EQUIVALENTS IN MEASURE.

(A drop of water at ordinary temperature weighs a grain and measures a minim.)

1 drop (ab. gtt.).....	mi	or 0.06 c.c.
1 teaspoonful.....	3i	or 4 c.c.
1 dessertspoonful.....	3ii	or 8 c.c.
1 tablespoonful.....	3ss	or 16 c.c.
1 wineglassful.....	3ii	or 64 c.c.

METHODS OF ADMINISTERING MEDICINES.

A medicine applied to only one certain part of the body is said to have a LOCAL action. Others have a GENERAL action.

METHODS BY WHICH MEDICINES ARE MOST FREQUENTLY GIVEN FOR GENERAL ACTION.

1. By mouth.
2. By rectum.
3. By injection under the skin (hypodermatic).
4. By inunction into the skin with a fatty base.
5. By injection into a vein (intravenous).
6. By inhalation.

DOSAGE.

Dosage is modified and is greater or lesser, depending on various conditions.

CONDITIONS WHICH MODIFY DOSES.

1. **Age and Weight.**—*a.* Large and heavy individuals require larger doses than small persons.

b. Females require, generally, smaller doses than males.

c. The young and very old require smaller doses than the adult.

RULES TO DETERMINE FRACTIONAL DOSES FOR CHILDREN.

YOUNG'S RULE.—Add one year to the child's age to make the numerator of your fraction. Take 25 as the denominator.

Example.—What is the dose of Basham's mixture for a child of five years? The child's age is five years, then, 5 plus 1 equals 6, the numerator; 25 is the denominator. The fraction, therefore, is $\frac{6}{25}$ or about $\frac{1}{4}$. The adult dose of Basham's mixture is ℥iv ; $\frac{1}{4}$ of ℥iv is ℥i —the dose for a child of five years.

Children over six months old may be considered one year old by this rule.

To determine the dosage for a child *less than six months old* take the *weight* of the child for the numerator and 200 for the denominator.

Example.—A child weighs 10 pounds; $\frac{10}{200}$ or $\frac{1}{20}$ of the usual adult dose would be required.

NOTE.—*Opium, morphine, and codeine are given in HALF THE DOSAGE required by above rules; cathartics, in relatively larger doses.*

2. **Disease** may cause larger or smaller doses to be given than the average; *i.e.*, large doses of morphine are required for excessive pain.

3. **Personal peculiarities** and habits of life may so modify the action of drugs as to require larger or smaller doses.

4. The **method of administering** modifies the dose markedly. Taking the dose as given by the mouth as normal, we may safely say that the *hypodermatic or intravenous method requires $\frac{1}{2}$ less and the rectal method twice as much as the dosage by mouth.*

TIME AND FREQUENCY OF ADMINISTRATION.

A. FOR LOCAL ACTION.

a. On the mouth and throat must be used frequently—every hour or so. No food immediately afterwards.

b. On the Stomach.—To medicate the stomach walls give $\frac{1}{2}$ to 1 hour before meals. To act on stomach contents, during or after meals.

c. On the Intestine.—Must be given two or three hours after meals.

d. On the Rectum.—After the bowels have been emptied.

B. FOR GENERAL ACTION.

To obtain a single, rapid action, give the remedy, if possible, in hot concentrated solution on an empty stomach. Remedies must be given with regard to the time of their action; slow acting cathartics, as pills, at night; rapidly acting ones, as Epsom salt, in the morning.

To obtain a more or less continued action, give the remedy three times a day, after meals.

GENERAL RULES OF DOSAGE FOR OFFICIAL PREPARATIONS.

Each c.c. of a *fluidextract* represents one gramme (1 Gm.) of the drug. Each *minim* represents one grain of the dry drug. Therefore they are of 100 per cent. strength.

All *potent or poisonous tinctures* are 10 per cent. in strength or $\frac{1}{10}$ the strength of the fluid-extract or dry drug.

Extracts (solid) are usually four times the strength of the fluidextracts.

The *important potent tinctures* are aconite, belladonna, cannabis indica, cantharides, capsicum, digitalis, ferric chloride, gelsemium, hyoscyamus, iodine, lobelia, nux vomica, opium, squills, strophanthus, and veratrum. These are given in doses ranging from 0.5 to 1 c.c. (℥viii to xv). *Fluid-extracts*, corresponding, would be given in $\frac{1}{10}$ this dose, or 0.05 to 0.1 c.c. (℥i to ii). *Extracts* (solid) of potent drugs usually have $\frac{1}{4}$ this strength and a dosage of 0.015 Gm. or gr. $\frac{1}{4}$.

Most other tinctures, excepting a few seldom-used potent ones, are given in doses of 2 to 4 c.c. (℥ss to ℥i).

All *syrups* may be given in doses of 2 to 4 c.c. (℥ss to i) excepting the syrups of iodide of iron, ipecac, squills and squill compound, each of these being given in a dosage of 1 to 2 c.c. (℥xv to ℥ss).

All *spirits* have a dosage of 1 to 2 c.c. (m_{xv} to xxx) excepting spirit of nitroglycerin, the dose of which is 0.06 c.c. (m_i).

All *mixtures* have a dose of 4 to 8 c.c. (3i to 3ii).

All *pills* have a dosage of two pills, excepting pill of phosphorus and pill of opium, the dose of each of these being one pill.

QUESTIONS.

1. Define a remedy, an "official" preparation. What is the difference between a water and a spirit? between a solution and a mixture? between an infusion and a tincture? How do tinctures differ from fluidextracts and extracts?

2. What are the units of weight and capacity of the apothecaries' system? of the metric system? Write, properly, the sign for the units of both systems and their abbreviations. How are these units divided and multiplied to obtain the other quantities? Write the table for each system.

3. Write the three rules for converting the apothecaries' into the metric and give an example of the application of each. Write the four rules for converting metric quantities into the old system and give an example of each.

4. Give the equivalents in the metric and old system of a drop, a teaspoonful, dessertspoonful, tablespoonful, wineglassful. Write the quantities in each system.

5. Name some of the conditions which modify dosage. What is Young's rule? Give an example of its application. What drugs are *not* subject to this rule?

6. What is the percentage strength of the fluidextracts? of the potent tinctures? of the extracts? Name the important potent tinctures. Give the general rule for the dosage of official syrups, spirits, mixtures, pills, tinctures, fluidextracts, and extracts of potent drugs.

PART II.

HOW MEDICINES ACT.

IN order to understand the action of drugs, it is needful to remember much of the physiology of the body and of its organs. Disease is a departure from the normal, and the aim of the physician in giving a medicine is to change an abnormal function into a normal one. So we must understand the normal action of our organs and tissues in order to appreciate the effect of medicines in disease. Why do our hearts beat, our arteries throb, our nerves carry sensation, our kidneys secrete urine? One must know the why and wherefore of these functions in order to understand the manner in which drugs alter them.

A *symptom* is an abnormal manifestation of some function or other. Symptomatic treatment is the giving of a drug which will produce an effect just opposite to the effect produced by the disease.

THE NERVOUS SYSTEM.

Many drugs act on the nervous system, and modify function through this action. It will be remembered that the *central* nervous system consists of the *brain* and *spinal cord*, with the cran-

ial and spinal nerves. The *sympathetic* nervous system consists of a number of ganglia. All through the nervous system we find *nerve-cells*, little cells which originate nerve impulses. Attached to these cells are little fibres which conduct these impulses always away from the cell. Cells which impulse *away* from the brain and cord are largely *motor* nerves governing motion; cells which carry sensation *to* the brain and cord are largely *sensory* nerves carrying sensation. A nerve-cell with its fibres is called a *neuron*.

There are some cells in the brain called psychic cells, which seem to have something to do with mental activity.

All nerve-cells may have their functions increased or diminished by the action of drugs. The drugs may act on the cells themselves, or on the nerve-fibres, or on the terminations of the nerve-fibres. A drug stimulating or depressing any one of these parts of a *neuron* would have a corresponding action on the function of the nerve.

In the central nervous system, and especially in that lower part of the brain called the *medulla*, are several collections of nerve-cells which are the starting point of some nerves with very important functions. Here we find the "centres" for the *pneumogastric nerve*, the *vasomotor centre*, which regulates the calibre of arteries, the *centre for respiration*, and the *centre for vomiting*, and

other important centres, especially those of the special senses.

The *pneumogastric nerve* sends fibres to the larynx, lungs, heart, stomach, and intestine.

The *vasomotor centre* sends out vasoconstrictor and vasodilator fibres, the former when stimulated tightening, the latter relaxing, the arterial calibre. The constrictor fibres predominate, and their stimulation causes a rise of blood-pressure.

THE SPINAL CORD.

The cord is able to perform many automatic functions of the body without the intervention of the thinking brain. These acts are termed *reflex*. When drugs stimulate the cells of the spinal cord, these *reflexes* are increased. A very great increase of these reflexes causes *convulsions*.

THE HEART AND CIRCULATION.

THE HEART.

The regular beat of the heart is dependent upon at least three factors; first, the ability of heart muscle to contract when stimulated; second, the influence of the pneumogastric nerve in slowing this beat; third, the probable influence of the sympathetic nerve in quickening this beat.

A drug would *slow* the heart either by, (1) depressing the heart muscle or the sympathetic

nerves, (2) stimulating the pneumogastric centre, or (3) increasing the resistance in the arteries. A drug would *quicken* the heart by (1) stimulating the heart muscle or sympathetic, (2) paralyzing the pneumogastric, especially its terminations, or (3) *decreasing* the resistance in the arteries.

THE PULSE AND ARTERIES.

All the arteries and veins contain muscle which is supplied with vasomotor nerves. These nerves originate in the vasomotor centre. The calibre of the arteries may be lessened or increased by the action of a drug on this centre. Stimulation of the vasoconstrictor centre will *increase* the calibre of the vessels, and depression will *decrease* it. The drug may also act *directly* on the muscle of the vessel and produce the same effect. A pulse of high tension is usually slow in rate; a pulse of low tension is usually fast in rate.

THE BLOOD.

The blood is composed of formed and liquid elements which may be altered by disease. The formed elements are the red and white blood-cells. The liquid element is the plasma. The red cells contain a substance called hæmoglobin which carries oxygen to the tissues of the body and constitutes our "internal respiration." Alterations in the number of these cells, or in the

quantity of hæmoglobin in each one, or chemical substances changing the hæmoglobin, cause disease. Certain drugs are used to stimulate the formation of, and the hæmoglobin content of, these red cells.

The white cells may also be increased or diminished in number and activity by the administration of drugs. An increase over the normal of these white cells is called a *leucocytosis*; a decrease is termed a *leucopenia*.

RESPIRATION.

Respiration is an automatic process only partly under the control of the will. In the medulla is the respiratory centre which is very sensitive to various stimuli, nearly all of the sensory nerves being able to influence it.

A proper amount of carbon-dioxide gas in the blood has probably the greatest influence in keeping the centre active. Certain drugs stimulating this group of nerve-cells make the respirations deeper, more rapid, and more effective; other drugs depressing it render respiration shallow and slow. Coughing, sneezing, etc., are all reflex acts originating in this centre, and depending on irritability of the centre.

DIGESTION.

The hydrochloric acid and pepsin in the stomach, the bile and pancreatic juice in the

small intestine are necessary for digestion. Deficiency of any of these elements may be remedied by proper drugs. The absorption of water in the alimentary tract takes place largely in the last third of the large intestine.

PERISTALSIS.

Peristalsis is the worm-like movement of the digestive tube by which the liquid food is slowly pushed along and churned until it reaches the last part of the large intestine. Here it becomes more or less solid because of the absorption of its water. This *peristalsis* is due to the action of muscle in the walls of the alimentary tract, and this muscle is supplied with sympathetic nerves. Certain drugs may stimulate or diminish peristalsis by their corresponding action on these "*plexuses*" of nerves.

HEAT.

The heat of the body is produced through the activity of its organs and tissues, especially the muscles. The distribution and regulation of this heat is controlled by the blood-vessels and the sweat-glands. It is believed that at the base of the brain is a so-called "heat centre," which automatically regulates the production and distribution of heat, so that the body remains at a constant temperature. Drugs increas-

ing perspiration or acting on this centre may influence the body temperature.

GLANDS.

The activity of the glands is dependent upon their blood supply, and also upon the action of certain secretory nerves which seem to stimulate the little gland cells to action. Drugs acting on these nerves, especially their terminations, may increase or decrease the function of the glands, according as they stimulate or depress these nerves.

PAIN.

Pain is due to an irritation of the end of a sensory nerve. Pain impulses are conveyed through the gray matter of the spinal cord. So drugs may cause cessation of pain by depressing the *ends of the nerves*, by depressing the *cells* in the *gray matter* of the *spinal cord*, or by depressing the *termination of the cells* in the *brain*. Sleep is induced by using drugs which diminish or abolish the activity of sensory *nerve-cells in the brain*. The sense centres are rendered less irritable, and sleep follows.

QUESTIONS.

1. What is the central nervous system? the sympathetic nervous system? What is a neuron? How may drugs act on the neurons?

2. What are the important nerve-centres in the medulla? Describe their function.
3. What is the vasomotor centre and how does it act? What is a reflex?
4. In what different ways could a drug slow the heart or quicken the heart? How may drugs affect the pulse?
5. In what way may drugs act on the blood? How may respiration be affected by drugs? Describe how these drugs may act.
6. What is peristalsis and how may drugs affect it?
7. How may drugs affect the body heat? Describe the process in detail.
8. How may pain be abolished by drugs? Describe the mode of action of these drugs.

PART III.

IMPORTANT DRUGS AND MEDICINES.

Classification.—Drugs and medicines may be classified either according to their origin and chemical or physical properties, or according to their action in disease. For the sake of clearness and brevity, no inflexible classification will be followed in the pages following, either system being adopted, at need, to facilitate condensation and memorization.

Chief Uses of Drugs and Medicines.—The three most important purposes for which drugs and medicines are given in disease are: (1) to avert collapse or death; (2) to eradicate, if possible, the cause of the disease; (3) to relieve pain or other symptoms of disease.

Most drugs and remedies belong to the first and third classes. Very few drugs, of themselves, can eradicate the cause of a disease. Remedies that act as curative agents on the *cause* of the disease are said to be SPECIFIC remedies. Remedies that simply modify symptoms, and most drugs are of this class, are called SYMPTOMATIC remedies.

A. INORGANIC SUBSTANCES.

Any substance *not* of animal or vegetable origin is said to be inorganic. In medicine,

many inorganic substances are used, and among them we frequently hear of *acids*, *bases*, *salts*, and *metals*. We must remember that salts are formed by the union of metals, or compounds of metals called bases, with either acids or certain elemental substances, such as iodine, bromine, etc. When an acid forms a salt the name of that salt ends in *ate* or *ite*, as when sulphuric acid unites with iron, it makes iron sulphate, or sulphite, as the case may be. But when an elemental substance, not an acid, unites with a metal to form a salt, the name of the salt ends in *ide*, as when the metal potassium unites with iodine to form potassium iodide. *Ide* then means "nothing else"—potassium, iodine, and nothing else. We will consider some of the important salts used in medicine.

I. SALTS OF THE ALKALI METALS AND AMMONIA.

Certain metallic elements known as sodium, potassium, lithium, and strontium, and a base known as ammonia, form compounds with iodine and bromine which are called iodides and bromides. The iodine and bromine are the predominating elements, from a therapeutic standpoint, in all of these salts, and so they may be considered in a single group, since in their chemical, physical, and therapeutic properties they resemble one another.

THE BROMIDES.

Bromide of.....	{	Sodium.
		Potassium.
		Ammonium.
		Lithium.
		Strontium.

All of these are freely soluble in water and have a salty taste.

PHYSIOLOGICAL ACTION.—Large doses produce drowsiness and apathy but not actual stupor. The individual is not able to think, or talk, or move so rapidly as before. The mucous membranes, especially of the throat and pharynx, will be found to have partially lost sensation. The action on the circulation is to slow the pulse. The reflexes (see physiology for definition) are lessened in intensity, and this is evidence that the drug depresses the nerve-centres in the spinal cord as well as in the brain. Large quantities, especially of the bromide of potassium, will depress the heart.

UNTOWARD EFFECTS.—When any bromide is given for a long time, or in unusually large doses, or even in moderate doses to certain individuals who are unusually sensitive to its action, symptoms of the accumulation of the salt in the body tissues are seen, and this condition is known as *bromism*. *Bromism* is shown usually by a skin eruption, blotches and pustules appearing in considerable numbers. Patients taking bromides

should be watched carefully for these eruptions. The skin troubles are due to imperfect elimination of the bromide through the skin, and careful and regular bathing will usually prevent their appearance. *Indigestion* and loss of appetite are also symptoms of the excess of bromide medication. *Loss of memory, apathy, and a fine tremor* of the hands and fingers are sometimes seen, even up to the point of marked unsteadiness of gait.

THERAPEUTIC USES.—Since bromides depress the brain and spinal cord and retard thought, they are used to counteract conditions in which the brain and spinal cord are irritated, as the irritability following *mental shock*, the *delirium of intoxications*, in *insomnia*, and *other irritable conditions of the nervous system*. Their chief use, however, is *antispasmodic*, being used to control *spasms of epilepsy*, of *tetanus*, and of *strychnia poisoning*. In *vomiting due to brain irritation*, they are sometimes useful. Their *hypnotic* use is confined to cases in which the loss of sleep is due to some cause other than pain.

DOSE AND ADMINISTRATION.—All of the bromides may be given in doses of 0.5 to 2 Gm. (gr.viii to xxx). They are usually given in an aromatic elixir. If dispensed in powder or solution in water, milk will frequently disguise their salty taste, if the dose given is not too large.

THE IODIDES.

Iodide of..... $\left\{ \begin{array}{l} \text{Potassium.} \\ \text{Sodium.} \\ \text{Ammonium.} \end{array} \right.$

All of these salts resemble their sister salts, the bromides, in many respects. All possess a salty taste and are freely soluble in water. One hundred Gm. of iodide of potassium will dissolve in 75 c.c. of water at ordinary temperature.

PHYSIOLOGICAL ACTION. *Excretion*.—Iodides are excreted by the skin and mucous membranes, and are supposed to owe their virtues to the liberation of iodine in these and other tissues of the body. It is for this reason that iodides are known as alteratives,—from their supposed ability to stimulate tissues to healthy reaction.

Iodism.—Some individuals cannot tolerate even small doses of the iodides—they are said to have an *idiosyncrasy* toward this drug, which means an unexplained susceptibility to its action. In such individuals, or when fairly large doses have been taken, symptoms referable to *iodism*, *i.e.*, iodide saturation, appear. First, the patient complains of frontal headache, then a catarrh of the nose may appear, with reddened eyelids, or sneezing, or sore throat. Very often skin eruptions similar to those seen in *bromism* appear. These symptoms are due

to the irritating and stimulating action of iodine on the lining membrane of the nose, throat, and trachea. When a patient is taking iodides, the foregoing symptoms should be carefully watched for and placed on the record when they appear.

THERAPEUTIC USES. *Antisymphilitic.*—Iodides are almost specific in their action in the later stages of *syphilis*. Doses even up to 4 Gm. (3i) three times daily are used in this disease, especially when the brain is involved.

Expectorant.—Their stimulating action on the bronchial mucous membrane render iodides invaluable in coughs and asthma where the bronchial secretion is scanty.

Alterative.—In the so-called *chronic rheumatisms* and in *pleurisy with effusion*, iodides have long been credited with curative or palliative virtues. The many patented "sarsaparilla" nostrums contain iodides. Also in *thyroid gland diseases*, in *arteriosclerosis*, and in *lead and mercury poisoning*, iodides have been used extensively.

PRECAUTIONS.—Since iodides are excreted by the skin and mucous membranes, they are liable to irritate these membranes. Therefore, patients should be carefully and frequently bathed, and their teeth and mouths cleansed and frequently examined. Gastric irritation is not uncommon among those who take iodides.

ADMINISTRATION.—All the iodides may be given in doses of from 0.5 to 4 Gm. (gr.viii to 3i).

They are usually given in a saturated solution, one drop of which contains about one grain of the drug. The dose is increased by one drop daily until the desired amount is given, or symptoms of iodism appear. Milk is a good fluid in which to give iodides. Iodides should be given about an hour after food.

Two syrups containing iodine are used in medicine: *syrup of hydriodic acid*, dose 2 to 4 c.c. (℥xxx to ℥i,) and *syrup of iodide of iron*, dose 0.5 to 1 c.c. (℥viii to xv).

SALTS OF AMMONIA.

Ammonia is a gas formed by nitrogen and hydrogen. Water forms a *base* with this gas, which in turn, like the metallic bases (sodium, potassium, iron, etc.), unites with acids or certain elements to form salts. In addition to the *iodide and bromide of ammonia* which we have considered, there is a *chloride* and a *carbonate of ammonia*, both of which have a wide use in medicine, as well as an official *water of ammonia*.

Carbonate of Ammonia.—This is a pearly-white substance with a strong odor of ammonia. It is commonly known as baker's ammonia or hartshorn, and is soluble in water.

PHYSIOLOGICAL ACTION.—Carbonate of ammonia neutralizes acids. When inhaled, the free gas is very irritating, and through this action on the terminals of the fifth nerve in the nose, it

raises blood-pressure and slows the heart, acting reflexly. *When taken into the stomach* in sufficient quantity, it causes some irritation of the pneumogastric nerve and so slows the heart and raises the blood-pressure in the same way. Its use by *hypodermic injection* is therefore of doubtful value. It causes *mild nausea* also, and hence liquefies *bronchial secretion*.

Therapeutic Uses.—In *coughs*, carbonate of ammonia acts as a nauseating expectorant and increases the secretion of the bronchial tubes. The *aromatic spirit of ammonia* is a solution of *carbonate of ammonia* in *water of ammonia* and *alcohol*, with certain *aromatic oils* added. This preparation is given in conditions of the stomach where there is *excessive acidity*, *loss of tone*, and *flatulence*. It is also used as a *reflex heart stimulant* in sudden fainting spells and in certain diseases.

Administration.—*Carbonate of ammonia* should be given in solution, well diluted, in a dose of 0.3 to 0.5 Gm. (gr.v to viii). The *aromatic spirit of ammonia* should always be given in iced or cold water, in the dose of 1 to 2 c.c. (℥xv to xxx).

Chloride of Ammonia (Sal Ammoniac).—This salt occurs as an odorless, fine, or granular powder with a cold salty taste. It has few of the reflex effects of the carbonate on the heart, although large doses produce nausea. It has

been credited with the property of decreasing bronchial secretion, and is used for that purpose in bronchitis. Some authorities hold that in small doses it increases the bronchial secretion and that in large doses it decreases it. It is used rather extensively and is frequently combined with the *compound licorice mixture* (brown mixture). The average dose is 0.5 Gm. (gr.viii).

QUESTIONS.

1. What is a specific drug? What is an acid, a base, a salt? Name three bromides of the alkali metals. What effect do bromides have on the brain, the throat, the circulation and heart, the reflexes? What is *bromism*? How is it to be avoided? For what therapeutic uses are bromides employed? How are they given and in what doses?

2. Name three iodides. Why are they called alteratives? What is *iodism*? Describe its symptoms. What are the therapeutic uses of the iodides? What precautions should be observed in giving them? Give doses and administration.

3. How does carbonate of ammonia affect the heart, the stomach, the bronchi? What are its therapeutic uses? How is it given? What spirit contains carbonate of ammonia? What is sal ammoniac? What are its therapeutic uses?

II. SALINE CATHARTICS AND "SALT ACTION."

SULPHATE OF MAGNESIA, SULPHATE OF SODA, PHOSPHATE OF SODA, TARTRATE OF POTASSIUM AND SODA.

We have found that certain substances known as salts are much used in medicine. Physiology teaches that similar substances also exist in all of the tissues and fluids of the animal body.

Of course all of these substances are absorbed through the stomach and intestine, and the rate of absorption of different chemical salts depends upon certain well-known physical laws, and also on certain less-known properties of living tissue. In general, it may be said that the constant effort of the body is to keep the amount of salts in the tissues at a certain definite concentration. It has been found that, normally, 9 parts of sodium chloride or common salt exist in every 1000 parts of human blood. So the sensation of thirst after taking an unusual amount of common salt in food is a wise provision of the body in calling for water to dilute the over-concentrated body fluids. Plainly, then, the various salts have various rates of absorption; some of them are readily absorbed, others not at all, and the results of these differences of absorption are known as "salt action."

To illustrate: If a dog with an open wound in his large intestine should be fed a normal salt (0.9 per cent.) solution, it will be found that little or no fluid will escape through the wound; most of it will have been absorbed before reaching that portion of the intestine. Let, however, a *weak solution of magnesium sulphate* or any of the other saline cathartics be fed to the animal, and very soon *fluid will flow freely from the wound*, showing that *it is not easily absorbed*. But, still further, if a *concentrated* solution of

magnesium sulphate be administered, the fluid escaping from the wound will be *greater than the amount ingested*. The concentrated saline, therefore, not only is not absorbed itself, but prevents the absorption of the rest of the fluid portion of the intestinal contents. So, *chlorides*, as also *iodides* and *bromides*, and some *other salts*, are absorbed with more or less ease; but *sulphates*, *phosphates*, *tartrates*, and *especially the salts of magnesia* are absorbed with difficulty and pass with the water dissolving them to the large intestine. If given in concentrated solution, these salts may even deplete the intestinal blood-vessels by robbing them of water. Since most of the fluid of the body is absorbed in the last portion of the small and one-half of the large intestine, the giving of a saline cathartic, which prevents this absorption, or even increases the secretion of fluid from the intestinal wall, produces the same effect, mechanically, as a high enema, and flushes the intestine from above.

PHYSIOLOGICAL ACTION.—The mechanical action of these drugs has already been explained, and also their power of absorbing water from the blood-vessels of the intestine. The vegetable cathartics act in a different way, that is, by irritating the nerves of the intestinal membrane and increasing the contractions of the intestine (peristalsis, see physiology).

THERAPEUTIC USES.—These saline drugs are used as cathartics when a quick-acting and non-irritating purgative is needed, as in the headache and fever due to constipation and putrefaction of intestinal contents (so-called "bilious attacks") and in the beginning of various *infections* and *contagious diseases*. Given in concentrated solution on an empty stomach, many of these purgatives will flush out the intestine within an hour.

When there is *dropsy*, as in heart, kidney, or liver disease, these remedies deplete the circulation of the abdomen by the evacuation of the fluid through the bowel.

MODE OF ADMINISTRATION AND DOSE.—*Sulphate of Magnesia* (Epsom Salt).—Occurs as coarse crystals, soluble in 0.85 parts of water. The dose is 16 Gm. (ʒiv— $\frac{1}{2}$ to 1 tablespoonful) in solution, preferably given in the morning in hot water, concentrated, and on an empty stomach.

Tartrate of Potassium and Sodium (Rochelle Salt).—A white powder soluble in 1.2 parts of water. Dose 8 Gm. (ʒii)—2 teaspoonfuls. A well-known preparation is the *compound effervesing powder* or *Seidlitz powder*. The blue paper contains bicarbonate of soda, 2.58 Gm. (gr.xl); Rochelle Salt, 7.75 Gm. (ʒii). The white paper contains tartaric acid, 2.25 Gm. (gr.xxxv).

On dissolving each in one-half glass of water

and mixing the solutions, an effervescing draught is produced.

Phosphate of Soda.—Occurs as a granular powder. The dose is the same as Epsom Salt. Another favorite saline purgative is the *solution of the citrate of magnesia*. This is given in a dose of $\frac{1}{2}$ to 1 bottle, *i.e.*, 180 to 360 c.c. "Milk of magnesia" is a tasteless liquid preparation used especially for infants in the dose of one to four teaspoonfuls.

QUESTIONS.

1. What is meant by salt action? How does salt action affect the saline cathartics? Name three saline cathartics and state briefly how they act. What are their therapeutic uses? How do they relieve "bilious attacks"? Give the doses and mode of administering three saline cathartics.

III. ARSENIC AND IRON.

ARSENIC TRIOXIDE, ARSENOUS ACID, WHITE ARSENIC.

The metal arsenic of itself is not used in medicine. The trioxide, one of its salts which has a very extensive use, is a white lumpy powder, very slightly soluble in water, and with a slightly sweetish taste.

PHYSIOLOGICAL ACTION.—On the *skin*, when applied for some time, it acts as an irritant or corrosive. The *nervous system* shows disease of the nerves, especially of the extremities (neuritis) after poisonous doses, showing that the drug

stimulates or irritates these nerves. On the *stomach* it acts as an irritant, increasing the blood supply. On the *blood* it is believed to exert an influence through the red bone marrow, influencing the latter to form more red cells. On the *viscera*, fatty degeneration of the liver, kidney, etc., has been noticed after large doses. However, in spite of its powerful irritant and caustic effects on the body tissues, a decided tolerance may be established for arsenic by gradually increasing the dosage. In certain parts of the Tyrol and Styria natives eat an earth containing arsenic to improve their personal appearance, and consume large quantities of the poison with apparently no ill effects.

THERAPEUTIC USES.—As a *caustic*, on account of its corrosive action, it is used as a paste in cancer, to destroy the nerve pulp of teeth in dentistry, and whenever a slow-acting caustic is needed. In the various blood conditions known as *anæmias*, especially those in which the number of red cells is diminished, arsenic is used extensively. In *neuralgia* and *chorea* it is employed for its supposed stimulating effect on nervous tissue, and in certain *chronic skin diseases* it is also given internally.

UNTOWARD EFFECTS.—When arsenic has been given for a while and the dose is gradually increased, most individuals show a peculiar puffiness of the eyelids. This symptom should be

looked for and recorded on the chart if seen, whenever a patient is given an arsenic preparation. This œdema of the eyelids, like *iodism* and *bromism*, is evidence that the therapeutic limit has been reached in the dose of the drug.

PREPARATIONS, DOSES, AND ADMINISTRATION. *Solution of Arsenite of Potassium* (Fowler's Solution). *Solution of Arsenate of Sodium*. *Solution of Iodide of Arsenic and Mercury* (Donovan's Solution).—All of these preparations contain 1 per cent. of arsenic. They are best given in water after meals, in increasing doses, till the desired effect is obtained. The dose to begin with is usually 0.2 c.c. (miii), increased by one drop daily. Fowler's solution is used almost to the exclusion of the other preparations.

The arsenic trioxide, in its original form, is given in pill or tablet 0.002 Gm. (gr. $\frac{1}{80}$), gradually increased. Three non-official pills, Blaud's compound pill, pill of quinine compound, and pill of sumbul compound, contain arsenic.

POISONOUS DOSES, SYMPTOMS AND TREATMENT.—Two kinds of arsenical poisoning may occur, the acute and the chronic. The acute usually occurs from the swallowing of rough-on-rats, Paris green, or the ordinary white arsenic or its official preparations, through mistake or with suicidal intent; the chronic, through inhalation of arsenic dust from wall-paper, or in certain occupations.

Acute Arsenic Poisoning.—The patient complains of a tightness in the throat, and great pain in the stomach region. Diarrhœa occurs, culminating in typical rice-water stools. There is much prostration, retching, and vomiting, and often complete suppression of the urinary secretion. Violent headache and pains in the muscles, followed by collapse and coma, occur in fatal cases. Death may ensue in twenty-four hours or may be delayed some days.

Treatment of Acute Poisoning.—Evacuate the stomach immediately, either by the administration of mustard water, or apomorphine, gr. $\frac{1}{16}$, by hypodermic, or by the stomach tube. Wash the stomach out well if the latter is used. The hydrated oxide of iron and magnesia is the official antidote for arsenic, but it is seldom available and there is much doubt as to its efficiency, or the efficiency of any chemical antidote for arsenic. Keep the patient quiet, and if the diarrhœa has not commenced, give by rectum 250 c.c. of coffee (3viii) made very strong. Morphine may be required for the pain and diarrhœa.

IRON.

Iron differs from most metals in being found in, and being essential to, the structure of many if not all forms of living matter, both animal and vegetable. There are, therefore, two kinds

of iron compounds—the organic and the inorganic. The ordinary salts of iron are types of the inorganic iron; the hæmoglobin of the blood, the type of the organic or albumin iron.

PHYSIOLOGICAL ACTION.—When a solution of a soluble iron salt, such as the chloride, is added to albumin, it precipitates the latter, forming a compound known as an albuminate. Mercury preparations destroy and corrode albumin; iron, however, simply makes the albumin insoluble, and has no corrosive action.

Therefore when a soluble preparation of iron is taken by mouth, an astringent metallic taste is produced, and in ordinary doses, no other effect is observed. Disturbance of the stomach and bowel may come from large quantities of iron at one time, and vomiting, gastritis, etc., may be the result. Constipation and dyspepsia may follow the long-continued use of iron salts, but the chief use of iron, therapeutically, is its long-reputed ability to increase the content of hæmoglobin in the red blood-cells, as well as its stimulating action in increasing the number of white cells. How and where iron is absorbed has long been a problem.

Absorption.—Iron is changed to an albuminate of iron in the stomach, and as such passes to the small intestine. Here, and in the large bowel, part of it is absorbed and passes into the portal circulation. By this route the organic

iron passes to the spleen and then to the liver, and perhaps later, through the general circulation, to the bone marrow. It is most likely that hæmoglobin is manufactured in the liver from the ingested iron. The normal amount of iron absorbed in a day by an adult person is 0.01 Gm. or gr. $\frac{1}{8}$, hence the uselessness of large doses which may irritate the large bowel or cause constipation.

THERAPEUTIC ACTION.—As a *hæmatinic* or blood builder, iron is used in chlorosis and other anæmias, especially when the hæmoglobin is deficient. It should not be used in fever nor in persons of a plethoric constitution, nor in patients with a gastritis of a severe grade.

As an *astringent*, the tincture of chloride of iron is used in combination with glycerin as an application in tonsillitis. Various salts and solutions of iron have been used to apply to bleeding points as a *styptic*, but have fallen into disfavor in recent years. The *sulphate* (copperas) has some use as a disinfectant of vaults, etc.

IMPORTANT PREPARATIONS AND ADMINISTRATION.—Pills of carbonate of iron (Blaud's pills), dose 2 pills; tincture of chloride of iron (muriated tincture), 0.5 c.c. (m̄viii); solution of acetate of iron and ammonia (Basham's mixture), 16 c.c. (3iv); elixir of phosphate of iron, quinine, and strychnia (elixir F. Q. & S.), 4 c.c. (3i); sulphate of iron (copperas), 0.125 Gm. (gr.ii).

All iron preparations should be given after meals to avoid stomach irritation. They should not be given in milk, except the unofficial peptonate of iron and manganese, which may be so given. Iron salts color the stools black when given internally.

QUESTIONS.

1. What is the action of arsenic on the skin? the nervous system? the stomach? the blood? What is its use in therapeutics? What unusual effects may be produced by its continued use? Name three solutions of arsenic, and how and in what doses are they given? Describe the symptoms and treatment of acute arsenic poisoning. What is Fowler's solution?
2. Name a well-known form of organic iron. How does iron affect the blood? How is it absorbed and in what daily quantity? What are its therapeutic uses? Give the proper name and dosage of Blaud's pill, muriated tincture of iron, Basham's mixture, copperas, elixir of F. Q. & S.
3. How should iron be given in relation to food? How do iron preparations affect the stools?

IV. MERCURY.

The very soluble salts of mercury are very poisonous; the less soluble and insoluble salts are less poisonous. Mercury salts combine rapidly with albumin, destroying it and forming an albuminate which is quickly absorbed. By this property, which is shared by most germicides, the soluble salts of mercury kill germs and prevent their growth, hence they are *germi-*

cides and *antiseptics*. Locally applied in strong solution, soluble salts of mercury are *caustic*.

PREPARATIONS.—*Mercury* (quicksilver) in its metallic form is used as the mass of mercury (blue pill) and mercury with chalk (gray powder), both of which are given in doses of 0.25 Gm. (gr. iv). Externally an ointment (blue ointment), a plaster, and the ointment of ammoniated mercury (white precipitate) are used.

Corrosive Chloride of Mercury (Corrosive Sublimate, Bichloride of Mercury, Mercuric Chloride).—This white crystalline powder is soluble in water and alcohol, about one part dissolving in sixteen of water. The addition of common salt or sal ammoniac makes it more soluble. The dose for internal use is 0.003 Gm. (gr. $\frac{1}{80}$).

Calomel (mild chloride of mercury and mercurous chloride) is almost insoluble. It acts as an antiseptic on the stomach and intestinal contents, preventing fermentation and putrefaction. It is the most satisfactory intestinal antiseptic. By its irritant action on the walls of the intestine it stimulates intestinal secretion and intestinal movements, and hence is a violent cathartic, but has no action in increasing the secretion of bile by the liver. It relieves the liver by emptying the intestine. The green color of the stools is characteristic of calomel purgation even when bile is absent. Calomel also acts as a stimulant to the kidneys by a direct action on the secreting tubules (see physiology).

All the salts of mercury stimulate the building-up and breaking-down processes of the body tissues, known as metabolism, and are believed to have an especially beneficial action on the blood. Calomel is a white, insoluble, tasteless powder. As a purgative it is given in fractional doses of 0.06 Gm. (gr.i) every half hour, or in a single dose up to 0.5 Gm. (gr.viii).

The compound cathartic pill contains calomel.

Green Iodide of Mercury (Proto-Iodide of Mercury).—This is an insoluble salt used principally in pill form in doses of 0.01 Gm. (gr.½), gradually increased to the point of extreme toleration.

The ointment of mercury is frequently given by inunction, rubbing a certain quantity on a portion of the skin surface of the body at intervals of a few days, to obtain the constitutional effects of mercury.

POISONING.—The *soluble* salts of mercury may cause *acute* poisoning; the *insoluble* ones most frequently cause the *chronic* form of poisoning. The *bichloride* (corrosive sublimate), taken in concentrated solution, will cause great pain, vomiting, a *sense* of burning in the stomach, and even convulsions and death. The antidote is milk or eggs in large quantities, the promotion of vomiting, and strong coffee by rectum.

Chronic mercurial poisoning (salivation) sometimes follows the administration of the mild

chloride or other more or less insoluble salts of mercury, when they are allowed to remain for too long a period in the intestinal canal. For this reason a saline purgative is usually prescribed to follow calomel.

Some individuals are very susceptible to mercury. The symptoms of salivation are a metallic taste, sore gums, ulcerations, loose teeth, loss of appetite, skin eruptions, etc.

Often increasing doses of mercury are given till the therapeutic limit is reached. In patients taking mercury, soreness of the teeth on biting hard should always be looked for and placed on record when found.

THERAPEUTIC USES.—As an *antisyphilitic*, especially in the earlier stages of the disease, the *green iodide*, the *gray powder*, the method of inunction, and the “mixed” treatment are used. The “mixed” treatment consists of a combination of bichloride of mercury in solution with iodide of potassium.

As a *diuretic*, calomel in the form of Niemeyer’s pill, a combination of calomel, digitalis, and squill, is much used in chronic Bright’s disease, cirrhosis of the liver, and similar conditions.

As an *antiseptic* and *germicide*, the bichloride is used in solutions of 1 to 500 to 1 to 10,000 in strength. To kill *parasitic insects*, lice, etc., the *ointment of ammoniated mercury* and the *blue ointment* are used.

As a *purgative* and *intestinal antiseptic*, calomel has the greatest use. Children of any age may be given relatively large fractional doses, without ill effects. *Gray powder* is much in favor as an antisymphilitic for children.

QUESTIONS.

1. How do mercury salts kill bacteria? Why are some salts of mercury more poisonous than others? What is the common name for mild chloride of mercury? What is the common name for the bichloride? Which causes acute poisoning? which chronic? Describe each form of poisoning. What is the treatment of acute poisoning? Name three preparations of metallic mercury, giving doses. What is the dose of the corrosive chloride? the mild chloride? the green iodide?

2. Name four therapeutic uses of mercury and its preparations. How used as a germicide? as a parasiticide? What is gray powder? Niemeyer's pill?

V. SILVER, MANGANESE, BISMUTH, AND CERIUM.

SILVER.

The two forms of silver most used in medicine are the nitrate and the various albuminates. The latter are proprietary preparations, and are, therefore, not in the Pharmacopœia.

Nitrate of Silver.—This occurs in the form of crystals, with a sharp, caustic, metallic taste. It causes whitening of the tongue when tasted. It is very soluble in water. It unites readily with albumin to form albuminates, and its caustic action is, therefore, not very deeply seated.

It is much used in dilute solution as an *astringent* for mucous membranes. Moulded into sticks it is called *lunar caustic* and is used to cauterize ulcers and granulating tissue.

In *colitis* and *ulcers of the rectum*, nitrate of silver, 0.5 Gm. (gr.viii) to 500 c.c., is frequently used as an injection, followed by salt solution. Internally, *nitrate of silver* is used in *ulcer of the stomach*. It is possessed of marked antiseptic and germ-killing properties, but it is rather irritating, and the fact that it stains the skin an indelible black makes its general use unpopular.

POISONING.—In concentrated solution, nitrate of silver acts as an irritant poison, producing vomiting, cramps, and prostration. The chemical antidote is common salt in teaspoonful doses. Chronic poisoning, characterized by darkening of the skin to a bluish tint, is called *argyria*. This comes from the too long-continued administration, internally, of silver nitrate.

The dose of nitrate of silver is 0.01 to 0.015 Gm. (gr. $\frac{1}{8}$ to $\frac{1}{4}$) given in pill form. The stools are colored black after its internal use.

Albuminates of Silver.—Several combinations of silver with albumin are extensively used in diseases of the eye, urethra, and other mucous membranes, since they are found to be less irritating than the other salts of silver and have valuable germicidal and astringent properties.

Argyrol is used in 10 per cent. solution to pre-

vent ophthalmia in new-born infants; a few drops are instilled in each eye at birth. Strength of 10 to 25 per cent. may be used in infections of the eye and urethra. For irrigation of the urethra or bladder, 1 to 1000 is the usual strength employed.

Protargol is more irritating than *argyrol*. Solutions stronger than 2 per cent. should not be freely used on mucous membranes.

MANGANESE.

The compound of manganese most used in medicine is *permanganate of potassium*. This is a purple, crystalline substance, dissolving in water to form a violet colored liquid, which in saturated solution stains the skin yellow. When this solution is brought in contact with organic substances, it yields up its oxygen and becomes colorless.

THERAPEUTIC USES.—This property of yielding up its oxygen makes potassium permanganate of use as an *antiseptic* and *deodorant*. In addition it has *astringent* properties. It is seldom used internally. Its principal uses are:

As an *irrigation* in *gonorrhœa*, beginning with a solution 1 to 6000 and increasing the strength up to 1 to 3000.

In *poisoning* from *alkaloids* such as morphine and strychnine, to wash the stomach with a 1 to 1000 solution in the hope of oxidizing the alkaloid.

In *snake-bite*, a saturated solution is injected in the tissues about the wound.

As a *germicide*, a saturated solution is applied to the hands in the operating room, followed by a saturated solution of oxalic acid. The oxalic acid removes the yellow stain of the permanganate and liberates oxygen in the skin. It is also used in a process for generating formaldehyde gas for the disinfection of rooms after contagious disease, by adding one part of the salt to three of formalin.

BISMUTH AND CERIUM.

Subnitrate of bismuth is a white, heavy, insoluble powder. It is a protective and mild astringent, and is used in therapeutics to protect irritated mucous membranes. Hence, it is given by mouth in *irritable vomiting*, *gastric ulcer*, and as a *protective* and *astringent* in *diarrhæa*. Locally, "bismuth paste" is injected into tuberculous sinuses.

Dose 0.5 to 4 Gm. (gr.viii to ʒi) in powder or suspended in mucilage. It colors the stools black. After extensive use of bismuth salts, either internally in large doses or locally as bismuth paste, certain toxic symptoms have been noticed, including gastric and intestinal irritation, a black line around the gums, and prostration with great depression of the circulation. These symptoms should not go unobserved.

Oxalate of cerium resembles bismuth subnitrate in its physical as well as its therapeutic properties, but its dose is 0.06 to 0.3 Gm. (gr.i to v).

QUESTIONS.

1. What two forms of silver preparations are most used in medicine? Which form is used internally? Give its doses. What are the therapeutic uses of the nitrate? What is the antidote for silver nitrate poisoning? Name two albuminates of silver. In what strength are their solutions used and for what purposes?
2. Describe potassium permanganate. On what properties do its therapeutic values depend? What are its principal uses in medicine?
3. Describe subnitrate of bismuth and oxalate of cerium. What are their properties, therapeutic uses, and doses?

B. ORGANIC DRUGS.

Organic drugs are remedies which have their source in the animal or vegetable kingdoms. Carbon is found in all of these, combined with hydrogen, oxygen, and nitrogen. Many vegetable drugs owe their medicinal virtues to certain substances which they contain, known as *alkaloids* and *glucosides*.

Alkaloids are organic substances containing nitrogen which have alkaline properties, and unite, like ammonia, with acids to form salts. While alkaloids are not usually soluble in water, their salts are. Familiar examples of alkaloids are morphine, obtained from opium, and strychnine, from *nux vomica*.

Glucosides are neutral organic substances, which when boiled with a mineral acid form grape-sugar (glucose) and water instead of salts.

I. HEART SEDATIVES AND DEPRESSANTS.

ACONITE (MONKSHOOD).

This is the root of the *Aconitum Napellus*. It owes its therapeutic virtues to an alkaloid, *aconitine*. This is so powerful that the dose is 0.00015 Gm. (gr. $\frac{1}{333}$). The fluidextract of aconite is given in doses of 0.065 c.c. (m $\bar{i}$), the tincture 0.6 c.c. (m $\bar{x}$).

PHYSIOLOGICAL ACTION.—Aconite first stimulates and later paralyzes the sensory nerves, acting on the end organs and producing local anæsthesia. It stimulates the vasodilator centre, dilating the blood-vessels of the body. On the heart it acts by stimulating the pneumogastric nerve and slowing the pulse. Later, if the dose is large enough, it paralyzes the heart muscle. From its action in reducing fever it is believed to depress that part of the brain which is supposed to regulate the loss of body heat—the heat centre.

THERAPEUTIC USES.—Aconite is used in *neuralgia* to abolish the pain in the affected sensory nerves, both through its local and general action. In *fever* accompanied by a strong, rapid, bounding pulse, it is sometimes used to slow the heart, promote perspiration through its vasodi-

lator action, and reduce the temperature by its effect on the heat centre. But it is a powerful drug, and must be used with caution.

POISONING.—Numbness and a tingling of the throat and skin are first noticed. The heart at first beats slowly; later, as the heart muscle becomes paralyzed, weakly and rapidly. In *treatment*, keep the patient on his back, give strong coffee by rectum, promote vomiting or wash the stomach, and give atropine sulphate 0.001 Gm. (gr. $\frac{1}{80}$) by hypodermatic injection.

VERATRUM (HELLEBORE).

This drug is the root of the *Veratrum viride*. It contains an alkaloid, *veratrine*. The preparations employed are the *tincture*, dose 0.5 to 1 c.c. (℥viii to xv), and the *fluidextract*, 0.1 c.c. (℥i).

Excepting that it does not dilate the blood-vessels so markedly, the physiological action of this drug is almost identical with that of aconite. It is used for the same therapeutic purposes, and is frequently employed in the convulsions of child-birth (eclampsia), to lower the tension of the pulse. In poisoning with this drug, vomiting is an early symptom.

QUESTIONS.

1. What are alkaloids? Give two examples. What are glucosides?
2. What is aconite? To what does it owe its properties? Name two preparations and give doses.

3. How does aconite act on the sensory nerves? on the blood-vessels? on the heart? on the temperature?

4. What are the therapeutic uses of aconite? What are the symptoms and treatment of aconite poisoning?

5. What is hellebore? Does it contain an alkaloid? Give two preparations and doses. Compare the physiological action of this drug with aconite. What are its therapeutic uses?

II. HEART STIMULANTS.

DIGITALIS (FOXGLOVE).

The leaves of the *Digitalis purpurea*. Digitalis contains five glucosides, the most important being *digitalin* and *digitoxin*. Digitalin is insoluble in water, hence it is not well adapted for hypodermatic use. A proprietary solution of digitoxin called *digalin* is given in doses of 1 c.c. (℥xv) by hypodermatic injection. The official preparations are: fluidextract, 0.065 c.c. (℥i); tincture, 0.5 to 1 c.c. (℥viii to xv); infusion, 16 c.c. (℥ss).

PHYSIOLOGICAL ACTION.—Digitalis and its preparations, when given in proper doses for a sufficient length of time, stimulate the circulation, and, especially, the heart. This action of digitalis is threefold:

1. It *slows the heart* by increasing the length of the diastole or resting period of the organ.

2. It *increases the strength of the contraction* of both the auricles and ventricles, and this increased pumping force increases the output of blood.

3. It *raises the pressure in the arteries* by a direct action on the muscular coats of these vessels, and probably, also, by stimulating the vasoconstrictor centre in the medulla, and, finally, by keeping the vessels more completely filled with blood.

The slowing of the heart, due to an increased diastole or resting period, is brought about by a tonic action of the drug on the nerve which normally slows the heart—the pneumogastric; while the increased force of the heart's contraction is due to a tonic action of digitalis on the heart muscle itself. *The pulse is, therefore, slower and more firm after digitalis.*

Another effect of giving this drug is to *increase the quantity of urine excreted*. It is especially efficient when dropsy or oedema from deficient heart action, has occurred. This oedema is due to a lack of sufficient pressure in the heart to drive the blood through the capillaries and into the veins. The back pressure in the veins and capillaries forces lymph into the tissue spaces, and the individual is water-logged. Digitalis acts by allowing the heart sufficient time to drain its veins more effectually, while it also increases the force of the heart-beat and the pressure in the smaller arteries. This action promotes the absorption of the lymph into the capillaries and drains the water-saturated tissues.

The blood-pressure in the arteries of the kid-

ney is also raised to a marked degree, so that more force is given to the filtration of the watery constituents from the blood, and their elimination in the form of urine. Thus, the action of digitalis on the urinary secretion seems to be more dependent on its action on blood-pressure than on any stimulating effect on the cells of the kidney itself.

CUMULATIVE EFFECT.—When digitalis is taken for too long a period, or in excessive doses, it produces a cumulative effect. This is because the active principles of this drug are absorbed and excreted very slowly. It takes from twelve to thirty-six hours to produce the characteristic action from an ordinary dose by mouth. So it is that when the drug has been administered for some time, excretion proceeds too slowly or absorption occurs too rapidly. This is the reason for the occurrence of the cumulative effect. The symptoms of cumulation are a small, slow, and intermittent pulse, accompanied by feelings of weakness and faintness, and sometimes nausea and vomiting. The production of this condition is favored by constipation or gastritis. When these symptoms occur in a patient who has been taking digitalis for some time, they should always be recorded.

THERAPEUTICS AND ADMINISTRATION.—Digitalis is the crutch of the disabled heart. It is used in *valvular heart disease*, in *conditions af-*

fecting the nutrition of the heart, such as occur in certain fevers, and as a *diuretic*, especially when *dropsy* or *œdema* occur.

The slowness of action of *digitalis* does not commend its use as an emergency heart stimulant. The comparative insolubility of *digitalin*, excepting Merck's German product, makes its hypodermatic use unreliable. It is therefore used more frequently for chronic than for acute conditions.

Given for long periods, it usually produces some irritation of the stomach; its cumulative action is not uncommon. Its most important use is in those heart conditions occurring when the heart valves are imperfect, the organ dilated and unable to empty itself, and the pulse small and rapid. Here, it slows the heart, allowing the auricles to fill more completely, and increases the force of its contraction or systole. The auricles after its use are emptied more rapidly, and in this way the heart is rested and strengthened.

The *tincture*, *fluidextract*, and *infusion* are the preparations most frequently used. They are given in water, after food, in the doses mentioned at the beginning of this chapter.

STROPHANTHUS.

The seeds of the *Strophanthus Kombé*. The active principle is a glucoside, *strophanthin*, which is soluble in water. The physiological action of this drug corresponds to that of digi-

talis; yet it does not raise the tension of the pulse or increase the urinary secretion to the same degree as the former drug. The *tincture* is given in doses of 0.5 to 1 c.c. (℥viii to xv). The glucoside, *strophanthin*, may be given hypodermatically in doses of 0.0003 Gm. (gr. $\frac{1}{180}$).

POISONING.—Acute poisoning by digitalis or strophanthus is rare. Patients who take excessive doses usually vomit as a result.

QUESTIONS.

1. What is digitalis? What important principle does it contain? Name three important preparations and their doses.
2. In what three ways does digitalis act on the heart? How does it relieve dropsy? How does it affect the kidney? What may occur when digitalis has been taken over a long period and why? How would you detect this condition?
3. For what purposes is digitalis given in therapeutics? Is it a good emergency heart stimulant? What are its disadvantages? How are the preparations given?
4. What is strophanthus? What is its active principle? How does it compare with digitalis in its physiological action? What are its properties? How should they be given and in what doses?

III. STIMULANTS TO THE HEART AND NERVOUS SYSTEM.

NUX VOMICA (POISON NUT).

This is the seed of the *Strychnos Nux-vomica*. Its active principle is an alkaloid called *strychnine*.

Strychnine *slows the heart*, acts as a *vasomotor stimulant* increasing the tension of the pulse and

increases the depth of respiration through its action on the nervous centres in the medulla and spinal cord. Small doses of strychnia improve the appetite, slow and strengthen the pulse and sharpen the special senses. Poisonous doses produce stiffness in the muscles of the neck, contractions of the face muscles often resulting in a ghastly grinning expression, and marked convulsions frequently arching the body till only the head and feet touch the bed (opisthotonos). Death usually results from exhaustion and paralysis of the muscles of respiration. It is preceded by cyanosis.

THERAPEUTIC USES AND ADMINISTRATION.—Strychnia and nux vomica are given as *stimulants to the circulation and digestion*. Unlike digitalis, strychnia has no direct nutritive action on the heart muscle; its effects come chiefly through the nervous system. It is a much-used drug in general lack of tone, as it has a marked effect in such conditions. Nux vomica is frequently employed in diseases of the stomach and intestines. As an emergency heart tonic and respiratory stimulant, strychnia is frequently used, especially by hypodermatic injection. The effects of overdoses are shown in muscular twitching and quick involuntary "starts."

The preparations most frequently used are: strychnia sulphate, 0.001 Gm. (gr. $\frac{1}{80}$); fluid-

extract of nux vomica, 0.06 c.c. (℥i); extract of nux vomica, 0.01 Gm. (gr. $\frac{1}{10}$); tincture of nux vomica, 0.5 to 1 c.c. (℥viii to xvi).

TREATMENT OF POISONING.—If convulsions have not begun, produce vomiting with mustard water. If the patient has convulsions, give chloroform and wash the stomach with a solution of tannic acid, a teaspoonful to a pint, or strong tea, or permanganate of potash solution, 1 to 6000. Chloral and the bromides should be given in double doses, by mouth or rectum. The patient should be frequently catheterized, and kept in a quiet, dark room.

CAFFEINE.

This is a basic principle found in tea, coffee, and kola. It is sparingly soluble in water.

PHYSIOLOGICAL ACTION.—Caffeine is a powerful drug which stimulates the functions of the brain, the heart, the lungs, and the kidneys.

On the *nervous system*, caffeine has a remarkable action. While it stimulates the spinal cord in a manner similar to the action of strychnia, it stimulates also the brain—in short, it increases our powers of perception and helps our reception of ideas. On the medulla, it stimulates the vasomotor centre, raising blood-pressure, and, like strychnia, has a tonic action on the respiratory centre.

Muscles respond more quickly, contract more fully, and fatigue less easily after caffeine has been given.

The *heart* beats more forcibly and more rapidly, for caffeine acts on heart muscle as it does on voluntary muscle, increasing its efficiency.

The *pulse* is increased in tension as well as in rate.

The *respiration* is quickened, and strengthened, after caffeine.

The *secretion of urine* is increased by a direct action of the drug on the secreting cells of the kidney, increasing the elimination of waste products. In this, caffeine differs from digitalis, which increases the amount of urine only by increasing the blood-pressure in the kidney.

THEOBROMINE.

This is an alkaloid obtained from the chocolate bean. Its action on the kidney and the circulation resembles that of caffeine, but it does not affect so markedly the brain or the blood-pressure. It is also more irritating to the stomach. A mixture of theobromine with salicylate of soda, known as diuretin, has a wide use.

THERAPEUTIC USES AND ADMINISTRATION.—Caffeine is a useful drug in *poisoning from narcotics*—opium, carbolic acid, and alcohol—on account of its action on the heart and respiration.

In *dropsy* and *œdema*, whether from disease of the heart or kidneys, caffeine and theobromine are useful as stimulants to the circulation. In *kidney diseases*, the diuretic action of theobromine and diuretin is superior to that of caffeine.

Citrated caffeine is a soluble preparation of caffeine, given in a dosage of 0.12 Gm. (gr.ii).

Caffeine-sodium-benzoate has a similar dose but may be given hypodermatically—a valuable point in coma.

Diuretin is given in doses of 1 Gm. (gr.xv) well diluted with water.

COFFEE AND TEA.—Coffee of average strength contains one to two grains of caffeine in every cupful. Tea contains, in its dry state, more caffeine than coffee, but less of the material is used to a cup. On account of the stimulating action of these beverages on the brain, heart, and spinal cord, they are harmful to nervous individuals. Cocoa and chocolate owe their stimulating properties to theobromine. Theoretically, they are less harmful than coffee, but this advantage is offset by their tendency to irritate the stomach.

CAMPHOR.

Camphor has long been employed as a stimulant to the heart and circulation when given by hypodermatic injection in oil. Experimental evidence seems rather against its usefulness in

these cases, and whatever its action may be its slow absorption renders it more or less uncertain as an emergency drug. Given by mouth, in collapse from various causes and the depression of fevers, etc., it seems to quicken the pulse and dilate the smaller blood-vessels. It is believed to act reflexly in these cases through its action on the stomach. Large doses may produce convulsions and coma. Externally it is used as a rubefacient.

The preparations used are: camphor-water, 15 to 30 c.c. (℥iv to ℥i); spirit of camphor, 1 to 2 c.c. (℥xv to ℥xxx); liniment of camphor (camphorated oil) used externally and by hypodermatic injection up to 2 c.c. (℥xxx).

QUESTIONS.

1. What parts of the nervous system does strychnia affect most markedly? How does its action affect the heart? the pulse? the respiration? What is the effect of small doses of strychnia? of poisonous doses? How is death produced in strychnia poisoning?
2. For what purposes are strychnia and nux vomica used in therapeutics? How does the effect of strychnia on the heart differ from that of digitalis? Is strychnia a good emergency heart stimulant? What effect does overdosage produce? Give the names and doses of four preparations.
3. Give the treatment of strychnia poisoning.
4. Caffeine stimulates the functions of what organs? How does it affect the nervous system? the muscles? the heart? the pulse? the respiration? the urinary secretion?
5. What is theobromine? How does its action compare with caffeine? What is diuretin?

6. Name three therapeutic uses of caffeine and theobromine. What preparation of caffeine may be used hypodermatically? What is its dose? What is the dose of citrated caffeine? of diuretin? Why should the latter be given well diluted? Why are coffee and tea injurious to nervous individuals?

IV. DRUGS PRIMARILY INCREASING BLOOD-PRESSURE.

ERGOT.

A fungus obtained from rye; contains one or more alkaloids.

PHYSIOLOGICAL ACTION.—In moderate doses it raises the blood-pressure by stimulating the vasoconstrictor centre in the medulla, and also by a direct action on the smooth muscle of the blood-vessels themselves. This action on smooth muscle accounts for its effect in producing contractions of the uterus. In large doses it may cause nausea and vomiting. Long-continued use may bring about gangrene of the extremities, especially in the aged.

THERAPEUTIC USES AND ADMINISTRATION.—Ergot is used to increase blood-pressure, especially in *certain forms of alcoholism*, as delirium tremens, when the pulse tension is low. It has a wide field in *uterine hemorrhage* on account of its action on uterine muscle.

The fluidextract is given in doses of 2 to 4 c.c. (3ss to ʒi); the extract, 0.25 Gm. (gr. iv.)

Several proprietary forms are intended for hypodermatic use.

SUPRARENAL GLANDS (ADRENALIN, SUPRARENALIN, ETC.).

These solutions of the active principle of the suprarenal gland are of a strength of 1 to 1000. An exactly similar preparation is now made from a coal-tar derivative—pyrocatechin. Injected deeply into a muscle or into a vein in a dose of 1 c.c. (mxxv), these solutions give a brief action similar to that of digitalis—slowing and strengthening the heart and raising the blood-pressure. Their use by mouth gives no such action, and some authorities assert that they are equally inert when given under the skin. Applied locally to mucous membranes, these preparations contract the blood-vessels and blanch the part by their local action.

THERAPEUTICS.—Suprarenal gland and adrenalin are much used in eye, ear, nose, and throat conditions. They are a valuable addition to cocaine in local anæsthesia,—1 to 300,000 is sufficient for infiltration. As a heart stimulant adrenalin acts rapidly but has a transient effect. For local hemorrhage it is sometimes efficient.

ADMINISTRATION.—For local use 1 to 1000 to 1 to 50,000 solutions are used. The solutions of adrenalin, suprarenalin, etc., on the market are 1 to 1000 strength. Adrenalin is said to lose its virtues by boiling; suprarenalin may be boiled.

When given by hypodermic, it should be injected deep in the muscle; under the skin it is rarely efficient. Gangrene of the skin may follow its use.

QUESTIONS.

1. Name three drugs that primarily increase blood-pressure. What is ergot? How does it act in moderate doses? in large doses? What may occur after long-continued use of ergot?

2. What are the therapeutic uses of ergot? For what condition is it used in obstetrical practice? What is the use of the fluidextract?

3. How do adrenalin and suprarenalin act? How are they given and in what doses? Are they effective when given by mouth? How do they act locally? What uses do they have in surgery?

V. MYDRIATICS AND ANTISPASMODICS.

BELLADONNA (DEADLY NIGHTSHADE).

The leaves of the *Atropa Belladonna* are used internally in medicine. These contain the active principle, an alkaloid, *atropine*.

PHYSIOLOGICAL ACTION.—Belladonna or atropine, in sufficient doses, causes a stimulation of the *motor area* of the *cerebrum*, resulting in a quick-moving and talking delirium. It has also another distinctive action on nervous tissue—it paralyzes the end-fibres of various nerves, notably those governing secretion, and the pneumogastric nerve, and the third cranial, or motor nerve of the eye. As a result of the paralyzing action on the nerves in glands, salivary, mucous,

sweat, and milk glands are rendered less active, the mouth and throat become dry, the skin hot. The third cranial nerve controls the tension of the muscle in the iris of the eye and the muscle which controls accommodation for far or distant vision, and so, after its paralysis by atropine, the pupil is dilated and accommodation is lost—we cannot see nearby objects. The pneumogastric nerve sends branches to the intestinal plexus through the splanchnic nerve. Atropine paralyzing these endings prevents intestinal spasm or “cramps.” Since this pneumogastric nerve is also the nerve which slows the heart, atropine, by paralyzing it, quickens the heart. It also acts on the vasoconstrictor centre in the medulla, raising the blood-pressure and especially constricting the large veins of the abdomen. This causes a compensatory dilatation of the vessels of the skin, causing the flushed face. Like strychnia, it stimulates the respiratory centre in the medulla.

THERAPEUTIC USES.—Atropine and belladonna are used to lessen the excessive secretion of sweat in tuberculosis, and to lessen the milk secretion by a plaster (belladonna plaster) applied to the breast.

When it is deemed necessary to quicken the heart and to determine whether an intermittent pulse is due to nervous influence or to disease of the heart muscle, atropine is useful.

As a respiratory stimulant in opium and other narcotic poisonings, and to paralyze the accommodation and dilate the pupil in certain eye diseases, it has a frequent use. The antispasmodic effect of atropine on the intestine is taken advantage of in the well-known pill of atropine, strychnia, and belladonna. The local action of atropine or belladonna is very doubtful. Both belladonna and atropine are frequently used in irritable conditions of the bladder—cystitis, incontinence, etc.

PREPARATIONS AND ADMINISTRATIONS.—Atropine sulphate, 0.0004 Gm. (gr. $\frac{1}{2500}$), is best administered by hypodermatic injection. Homatropine, seldom given internally, has the same dose. One per cent. solutions are used in the eye for the purposes above mentioned. Tincture of belladonna leaves, 0.5 c.c. (℥viii). Extract of belladonna leaves, 0.01 Gm. (gr. $\frac{1}{100}$). The ointment and plaster are frequently-used external remedies.

HYOSCYAMUS (HENBANE).

The dried leaves of the *Hyoscyamus niger*. This drug and its active alkaloid, hyoscyne (also called scopolamine) has the same physiological action as atropine, excepting as to its effect on the blood-pressure and on the cerebrum. Hyoscyne, unlike atropine, lowers the blood-pressure, sometimes alarmingly, when given in large doses.

On the cerebrum, especially when combined with morphine, it has a sedative action.

Hyoscine hydrobromide is given by hypodermatic injection in doses of 0.0005 Gm. (gr. $\frac{1}{160}$). Of the preparations of the drug itself, there is the tincture, 1 c.c. (m̄xv), extract, 0.065 Gm. (gr.i), and the fluidextract, 0.2 c.c. (m̄iii).

UNTOWARD EFFECTS.—Hyoscine and atropine may, in susceptible individuals, cause dryness of the throat, flushing of the face, and dilated pupils even in small doses. Sometimes delirium occurs, with rapid pulse. In poisonous doses there is a wild talking delirium, sometimes with collapse. Give hot coffee by rectum and small doses of morphine. The stomach may be washed with potassium permanganate, 1 Gm. to 1000 c.c. of water, if the poison has been recently swallowed. Cases of absorption from the eye with poisonous symptoms are not rare.

QUESTIONS.

1. What is belladonna? What alkaloid does it contain? How does it act on the brain? on the nerves? What result does it bring about in the glands? How does it affect the eye? the intestine? the heart-beat? the blood-pressure? the respiration?

2. What are the therapeutic uses of atropine? Give names and doses of several preparations.

3. What is hyoscyamus? What alkaloid does it contain? How does it resemble and differ from atropine? What is its dose and how is it given? Name two other preparations and give doses.

4. What untoward effect may occur in certain individuals from even small doses of these drugs? What are the symptoms of overdosage or poisoning? What is the treatment of poisoning?

VI. NARCOTICS.

OPIUM.

Opium is the concrete, milky exudate from the seed capsule of the poppy plant—the *Papaver somniferum*. It contains nineteen alkaloids, of which morphine and codeine are the most important. Dried opium contains from nine to twelve per cent. of morphine. Besides these two mentioned alkaloids, there are two other modifications of morphine used in medicine, one called heroin, the other apomorphine. They are, so-called, artificial alkaloids.

PHYSIOLOGICAL ACTION.—Small quantities of opium or morphine produce a condition of mental abstraction; large doses result in a drowsy condition from which the patient is easily awakened; but, if still larger doses are given, sleep comes, sleep which is deep, merging into torpor as the poisonous dose is reached.

POISON SYMPTOMS.—A deep, torpid sleep, from which the patient can with difficulty be awakened—perhaps even a comatose condition, in which no effort at rousing the patient succeeds—is characteristic of opium poisoning. The respiration is slow, and may be reduced to three

or four a minute; the pulse is full and somewhat slow, and the pupils are very much contracted. The face is usually purplish and congested. As a fatal termination is approached, the respiration becomes slower, then intermittent; the pulse becomes more rapid and more feeble; the face more and more congested, and, finally, respiration ceases.

SPECIAL EFFECTS. *Nervous System.*—Morphine abolishes pain by depressing the areas of the cerebrum which govern sensation and thought. It slightly stimulates the spinal cord at the same time, in a manner similar to strychnia. On the medulla it has the effect of depressing the respiratory centre and the vasoconstrictor centre. It has no local action on sensory nerves.

Circulation.—As an effect of the depressed vasoconstrictor action just mentioned, there is a slight dilatation of the superficial blood-vessels. The drug has little or no direct action on the heart.

Alimentary Canal.—Morphine and opium cause a contraction of the portion of the stomach which is joined to the intestine. After hypodermatic injection, morphine is soon found in the stomach and intestine, passing into these organs through the mucous membrane. A marked action in impairing the secretion and movements of the intestine follows the use of morphine and opium in man.

Codeine and heroin produce less depression of the cerebrum and a greater stimulation of the spinal cord than morphine. Their sedative action, especially in the case of heroin, on the respiratory centre is more marked, while their intestinal action is much less than that of morphine.

THERAPEUTICS.—Nothing can take the place of morphine and opium for the relief of pain. Small doses, frequently repeated, are most desirable, for no drug engenders the habit of its use more quickly than morphine. It should never be used for any length of time in acute conditions, nor at all, if avoidable, in chronic cases, unless a cure is hopeless.

In *insomnia* due to pain, morphine or opium will be effective where chloral or the bromides would fail.

In *coughs*, especially when the secretion is scanty, morphine, opium, and especially codeine and heroin, dull the sensibility of the respiratory centre, so that the impulse to cough is not felt so frequently.

In *diarrhœa*, *peritonitis*, *typhoid hemorrhage*, and similar conditions, opium as well as morphine is used to check the intestinal movements and secretions.

In *colds*, and *fevers*, Dover's powder is used as a diaphoretic.

Opium or its preparations should seldom be used in neurasthenic or hysterical patients. The

lessened self-control which characterizes these patients easily makes them slaves to the drug. In a certain number of individuals, opium and morphine produce violent nausea and vomiting.

APOMORPHINE.—Apomorphine is used as an emetic, and is usually given hypodermatically. It generally produces, after an ordinary dose, an effective and energetic emptying of the stomach, with little nausea, within ten minutes. In some cases, however, it has a purely sedative effect, similar to morphine.

TREATMENT OF POISONING.—Keep the patient breathing and awake, if possible. To do this, dash cold water on him or hit him with ice-water towels, if necessary. Give *very strong* coffee by rectum. For the respiratory paralysis, give atropine sulphate, 0.0005 Gm. (gr. $\frac{1}{160}$), by hypodermatic injection, and repeat it if needed. Since morphine is excreted in the stomach and often absorbed a second time in the intestine, wash out the stomach at intervals of half an hour with solution of potassium permanganate, 1 to 1000.

If the patient is breathing very slowly, and the face is purplish, give artificial respiration, seventeen movements to the minute. Even if breathing stops, *keep this up for one hour or longer, being assisted by relays of helpers*. Persistence in artificial respiration has saved many a victim of opium poisoning, when other means have failed.

ADMINISTRATION AND DOSAGE.—Opium is given in doses of 0.1 Gm. (gr.iss); powdered opium, 0.06 Gm. (gr.i); extract of opium, 0.03 Gm. (gr.ss); camphorated tincture of opium, 12 c.c. (℥iii).

All the other preparations of opium contain 10 per cent. of the drug. Since the dose of the powdered drug is one grain (0.06 Gm.), these preparations have a dosage of ten grains or ten minims (0.6 Gm. or 0.6 c.c.). This refers to tincture of opium, deodorized tincture of opium, vinegar of opium, wine of opium, and powder of ipecac and opium (Dover's powder).

Alkaloids.—Morphine sulphate, acetate, and hydrochloride have a dosage of 0.015 Gm. (gr. $\frac{1}{4}$); codeine phosphate and sulphate, 0.03 Gm. (gr. ss); apomorphine hydrochloride, expectorant, 0.002 Gm. (gr. $\frac{1}{50}$); emetic, 0.006 Gm. (gr. $\frac{1}{16}$). All of these salts may be given by hypodermatic injection.

QUESTIONS.

1. What is opium? What are its two most important alkaloids? What artificial alkaloids are obtained from it? What symptoms do small doses of opium or morphine bring about? What are the symptoms of poisoning on the respiration? the pulse? the pupils and appearance of the face?
2. How do morphine and opium affect the nervous system? the circulation? the alimentary canal? How does the action of codeine and heroin differ from the foregoing?
3. What is the chief use of opium and morphine in therapeutics? Name several conditions in which it is used. What are the dangers of its use in nervous individuals?

IMPORTANT DRUGS AND MEDICINES. 81

4. Describe the action of apomorphine. What advantage does it have in its mode of administration? How would you treat opium or morphine poisoning? Persistence in what measure is important?

5. What is the dose of powdered opium? of camphorated tincture of opium? of tincture of opium? What are the common names of the two foregoing preparations? What is Dover's powder? Give its dose. What is the dose of morphine sulphate? of codeine sulphate? of apomorphine hydrochloride?

VII. ANTIMALARIAL AND TONIC.

Bitter substances when given by mouth cause a sensation of hunger; for this reason they are known as the "bitter tonics." To this class belong all the vegetable drugs having a bitter taste, of which well-known examples are gentian, calumba, and cinchona. Cinchona, known also as Peruvian bark, owes its bitterness to an alkaloid, *quinine*, which has other properties not dependent on its bitter taste.

PHYSIOLOGICAL ACTION AND THERAPEUTICS.
—Quinine lessens the movements of the white cells of the blood, and lessens the activity of all of the cells of the body. Less body heat is produced on this account, so this drug has some antipyretic action. Malarial fever is due to a little parasite which multiplies in the red blood-cell. Quinine kills these parasites, having a specific effect on the cause of the disease, and causes the temperature to drop. Its antipyretic action is of less value in fever due to other causes.

Taken by mouth, it acts as a bitter tonic and *promotes gastric secretion*. It is used with great success in all forms of malaria, and in certain malnutritive conditions. It has become a household remedy in *colds* and *influenza*, but its use in these conditions does not seem warranted by its physiological action.

ADMINISTRATION.—The dose of quinine sulphate, bisulphate, and hydrochloride as a tonic is 0.06 Gm. (gr.i) three times daily. In malaria it is given in doses of 0.25 Gm. (gr.iv) three or more times daily. The elixir of phosphate of iron, quinine, and strychnia is given in the dose of 4 c.c. (3i).

Quinine is most frequently given in capsule or pill. For children, euquinine, tannate of quinine, and various vehicles such as syrup of licorice are used to eliminate the bitter taste.

UNTOWARD EFFECTS.—Even small doses of quinine will cause ringing of the ears in certain individuals. This is due to the congestion of the blood-vessels of the middle ear. Quinine should, therefore, never be given when earache is present. Gastric irritation and a papular or vesicular skin eruption may appear after its use.

Ringing of the ears, known as *cinchonism*, is present in nearly every case when the drug is given in full dosage, and if moderate in degree should cause no apprehension.

QUESTIONS.

1. What is the principal alkaloid of cinchona? How does quinine act on the body-cells? on the malarial parasite? What are its therapeutic uses? How is it given and in what doses? What unusual effects may it produce?

VIII. VEGETABLE PURGATIVES. SENNA, CASCARA, AND ALOES.

SENNA.

Senna is the dried leaves of the *Cassia acutifolia* and is raised extensively in Egypt. It contains a glucoside, cathartinic acid.

The best known preparation of senna is the compound licorice powder, which contains in addition sulphur, sugar, licorice, and aromatics. The dose of compound licorice powder is 4 Gm. (3i). There is a fluidextract, a syrup, and also the compound infusion of senna.

CASCARA SAGRADA.

Cascara sagrada, the dried bark of *Rhamnus Purshiana*, contains a glucoside called cascarin.

The fluidextract and aromatic fluidextract are given in doses of 1 c.c. (m xv). The extract has a dosage of 0.25 Gm. (gr. iv).

ALOE.

The evaporated juice of the leaves of several species of aloe. This also contains a neutral principle called aloin, which has the properties

of the drug. Its preparations are as follows: purified aloes, 0.25 Gm. (gr. iv); extract of aloes, 0.125 Gm. (gr. ii); tincture of aloes, 2 c.c. (℥ss); aloin, 0.0065 Gm. (gr. $\frac{1}{4}$).

There are several official pills containing aloes. The pill laxative compound, known also as pill of aloin, strychnia, and belladonna, is much used.

The compound cathartic pill contains calomel with colocynth, podophyllin, and other actively cathartic drugs.

Phenolphthalein, a coal-tar derivative, has recently been added to the list of purgatives. It is given in a dose of 0.06 Gm. (gr. i), preferably in pill or tablet.

PURGATIVE OILS.

Castor Oil.—A fixed oil expressed from the seed of the *Ricinus communis*. It contains a cathartic principle called ricinolein. The dose is 15 c.c. (℥ss).

Croton Oil.—A fixed oil expressed from the seed of the *Croton tiglium*. This oil contains crotonoleic acid, and the dose is 0.06 c.c. (m̄i).

PHYSIOLOGICAL ACTION.—On another page attention was called to the fact that saline cathartics act by preventing the absorption of water and keeping the intestinal contents liquid. Vegetable cathartics act in a different way. They irritate

the terminations of the delicate nerves in the mucous membrane of the intestine. As a result, there is an increased blood supply to this membrane, and increased outpouring of the watery secretion of the glands, and also an increased vigor in the peristalsis, or movement, of the intestines through the greater irritability of its coat of muscle fibres.

There are no satisfactory purgatives that may be given by hypodermatic injection.

Purgatives have been arbitrarily divided into laxatives, cholagogues, cathartics, etc. But this division is only a question of the relative strength of the various drugs. A laxative given in a large dose will have a cathartic action; a cathartic given in a small dose will act as a laxative.

THERAPEUTIC USES.—In ordinary constipation the vegetable purgatives, singly or combined, have a frequent use. For habitual constipation, a laxative pill of a purgative with belladonna and strychnia is most frequently employed.

Purgatives are much employed at the onset of fevers (see calomel), in disease of the brain, and in conditions in which dropsy or œdema is found.

When diarrhœa is caused by irritants in the intestine, purgatives aid the natural effort of the bowel to expel the irritating substance. *Castor*

oil has a frequent use in this form of diarrhœa. When a drug of small bulk is desired, as in mania, uræmic coma, eclampsia, etc., croton oil is frequently mixed with olive oil and dropped on the tongue. Aloes is given in amenorrhœa to increase the blood supply of the pelvis.

All purgatives act as intestinal antiseptics and remove from the intestine decomposing food, the absorption of which causes the well-known autointoxication, symptoms of lassitude, furred tongue, headache, etc., commonly known as "biliousness." As a matter of fact, few purgatives increase the flow of bile; there are few true cholagogues. Bile is necessary in the intestine to make resinous purgatives active.

TIME REQUIRED TO ACT.—Large doses of croton oil act inside of two or three hours. An eruption and violent intestinal irritation may follow excessive doses.

Cascara, castor oil and senna require from five to ten hours. Aloes and aloin take twelve hours or longer to give their full action. The saline purgatives, it will be remembered, act in one or two hours.

CONTRAINDICATIONS.—Mild purges should not be given in obstinate constipation, for here they only produce unproductive intestinal spasm and colic. An effective enema should be given when this result occurs. In menstruation and in pregnancy, violent purges, especially of aloes, etc.,

may cause increased uterine congestion, even up to the point of abortion. In collapse and intense anæmia, drastic purgatives are not to be used; enemas or mild purgatives are preferable. The property of aloes in increasing the pelvic and especially the rectal blood supply, renders the use of aloes inadvisable in persons suffering from hemorrhoids.

ADMINISTRATION.—Many of the vegetable purgatives are given in pill form. The compound licorice powder gives senna in an agreeable form for children. Castor oil is best given floated on the foam of carbonated water after being chilled by ice. Many, so-called, tasteless castor oils are sold for the use of children; also castor oil is furnished in flexible gelatin capsules.

QUESTIONS.

1. Name three vegetable purgatives. What vegetable purgative does compound licorice powder contain? What is the active principle of cascara? Give doses of two preparations of the latter. What is the active principle of aloes? What is the dose of aloes? of its active principle? What is the compound laxative pill?
2. Name two purgative oils. Give the dose of each. How does the action of vegetable purgatives differ from that of saline purgatives? Give several conditions in which vegetable purgatives are useful. Why are they used in "biliousness"?
3. How long a time is required for the action of croton oil? of castor oil and cascara? of aloes and aloin? When are purgatives contraindicated? Give the best method of administration of senna, of castor oil, of cascara and aloin.

IX. PRODUCTS OF COAL-TAR.

THE ANTIPYRETICS—ACETANILID, PHENACETIN,
ANTIPYRIN.

The first two are white powders practically insoluble in water. Antipyrin is freely soluble in water.

PHYSIOLOGICAL ACTION. *Antipyretic*.—These drugs when given to an individual with fever cause a prompt fall of temperature by a supposed action on the heat centre of the brain. They do not lower the temperature of a normal individual.

Analgesic.—They retard the passage of painful sensations to the brain by acting on the cells of the spinal cord. Unlike morphine, they do not relieve pain by dulling the sensibility of the brain. Consciousness is not lost with the use of these drugs.

Large doses gravely affect the composition of the blood and depress the heart muscle.

POISONING.—Collapse similar to shock often follows the use of these preparations. It is marked by a remarkable cyanosis or bluing of the skin, shallow respiration, fluttering pulse, and great mental apprehension. The skin is clammy and covered with cold perspiration.

THERAPEUTIC USES.—To reduce very high fever, these drugs are now only occasionally employed. They are best given when a fall in

body temperature is expected. They are valuable to relieve purely nerve pains of whatever character,—as neuralgia, headache, etc.,—but they are of little use when the pain is due to acute inflammation. Acetanilid has some use as an antiseptic and styptic. Phenacetin or acetanilid is the principle ingredient of the many widely-sold headache tablets, powders, salts, etc. Their use is dangerous.

PREPARATIONS AND DOSES.—Antipyrin and acetanilid may be given in tablet or powder, dose 0.25 Gm. (gr. iv). Antipyrin and the compound powder of acetanilid (acetanilid 7, soda bicarbonate 2, caffeine 1) are given in doses of 0.5 Gm. (gr. viii). These preparations are best given in powdered form with sugar, or in pill, tablet, or capsule.

SALICYLIC ACID AND THE SALICYLATES.

Salicylic acid may be made from the oil of wintergreen or willow leaves, but it is most frequently made from phenol or carbolic acid. All of the official salicylates excepting two, salol and oil of wintergreen, are pinkish-white powders with a sickening sweetish taste. Phenyl salicylate or salol is a grayish-white crystalline powder with a peculiar odor, and is not so soluble as the other salicylates. Salicylic acid is practically insoluble in water, and is a white powder made up of long glistening crystals. The salicylates

of ammonia, lithium, strontium, and sodium are official. These are all soluble in water, dose 0.5 to 1 Gm. (gr.viii to xv).

Methyl salicylate, the chemical name for oil of wintergreen, dose 0.5 to 1 c.c. (η viii to xv); phenyl salicylate or salol, dose 0.5 Gm. (gr.viii). Physostigmine salicylate, given usually by hypodermatic injection, has a trade name—*eserine*. It does not possess the characteristic therapeutic properties of the other salicylates. Its dose is 0.001 Gm. (gr. $\frac{1}{80}$).

PHYSIOLOGICAL ACTION.—Salicylic acid and the salicylates are antiseptic and germicidal. They cause a dilatation of the skin vessels and a lowering of the body temperature. They are irritant to the alimentary tract, and have a caustic action on epithelium.

THERAPEUTIC USES. *Antiseptic.*—Salicylic acid and salol are antiseptic. They have been used extensively as intestinal antiseptics in typhoid fever and other conditions.

Antipyretic.—These remedies lower temperature by dilating the skin vessels and causing perspiration.

Caustic.—The softening action of salicylic acid on epithelium is taken advantage of in the many corn salves and corn paints on the market.

Antirheumatic.—The salicylates are almost specific in alleviating the pain and lowering the fever of acute articular rheumatism. In the

so-called muscular rheumatism, and in tonsillitis, they are also efficacious, but have little effect on the various affections called chronic rheumatism. A modified salicylic acid known as "aspirin" is much used for its less irritating action on the stomach. The salicylates do not depress the heart in ordinary doses, but they are very irritant to the kidney and to the stomach.

UNTOWARD EFFECTS.—Vomiting may follow the use of salicylic acid or the salicylates, and loss of appetite is not uncommon. Often a peculiar delirium follows the use of these drugs, and a ringing in the ears is not an unusual danger signal. These manifestations should be anticipated and record made of any tendency toward them. Irritation of the kidneys following the use of salol is shown by the dark, smoky urine.

ADMINISTRATION.—Salol is best given in capsule or tablet. The other salicylates are best given in solution on account of their irritant action on the stomach. They should not be given on an empty stomach; preferably after meals.

PHENOL (CARBOLIC ACID).

This acid occurs in colorless needles which are soluble in twenty parts of water. These needles easily become liquid on the addition of alcohol, water, or glycerin, therefore, most of the acid sold is in a liquid form.

PHYSIOLOGICAL ACTION.—Phenol is caustic to the skin and lessens sensation locally. Taken internally, it paralyzes the brain and acts as a general poison to all the body tissues. Its direct poisonous action on the heart slows that organ. It irritates the kidneys and renders the urine smoky in color. It destroys bacteria very rapidly.

THERAPEUTIC USES. *Sedative.*—In vomiting it is used for its local anæsthetic action 0.06 c.c. (m̄i) in pill or solution.

Caustic.—In surgery phenol is used to cauterize infected wounds.

Antiseptic.—In surgery it is used as an antiseptic in 2 to 5 per cent. strength. It is not to be used in wet dressings, especially of the extremities, since its use in this way may result in gangrene.

Antipruritic.—The anæsthetic action of phenol makes it of use in itching.

Disinfectant.—For stools in typhoid fever and other diseases, phenol is a much used disinfectant, a solution of 5 per cent. strength being used.

Compound solution of cresol, lysol, creolin, etc., are impure cresol compounds used for the purposes for which carbolic acid is used. Creosote and ichthyol are similar in some respects to the various members of this group.

POISONING.—The odor and characteristic white stains and face are telltale of carbolic acid poisoning. The later effects resemble opium poisoning,—contracted pupils, slow pulse, and fail-

ing respiration, followed by rapid pulse, Cheyne-Stokes respiration, and death. The treatment of poisoning consists in washing out the stomach with diluted alcohol or whiskey, and using supportive measures as in opium poisoning.

QUESTIONS.

1. Name three coal-tar antipyretics. How do they act on fever? on pain? on the blood and heart? What are the symptoms of poisoning? How is it treated?
2. What are the therapeutic uses of these drugs? How are they given and in what doses?
3. Name three salicylates and give their dosage. What is methyl salicylate? phenyl salicylate? How do these drugs act physiologically?
4. What is the principal therapeutic use of the salicylates? Name two other uses in therapeutics. Mention the untoward effects that may follow their use. What kidney symptoms may occur? Why should salicylates not be given on an empty stomach?
5. What is phenol? Give its physiological action on the skin; the brain; body tissues; heart; kidneys. How does it affect bacteria? What are its therapeutic uses in medicine? in surgery? How is it used as a disinfectant?
6. Give symptoms and treatment of phenol poisoning.

X. ALCOHOL AND THE ANÆSTHETICS AND HYPNOTICS.

ALCOHOL.

Alcohol is used in medicine in the form of brandy, whiskey, various wines, and the malted liquors such as ale and beer. Whiskey and brandy are about 50 per cent. alcohol, wines

6 to 20 per cent. and the malt liquors, 4 to 7 per cent. The so-called fermented malt extracts contain about 5 per cent. alcohol. Alcohol made from grain is used in many official preparations, spirits, elixirs, tinctures, etc., and so is very important in pharmacy.

The dose of alcohol is from 4 to 16 c.c. (ʒi to ʒiv). Diluted alcohol or brandy may be given hypodermatically.

PHYSIOLOGICAL ACTION.—Alcohol affects first the higher centres of the brain, paralyzing, so to speak, the will power. The early symptoms of intoxication are symptoms of lessened self-control, talkativeness, and an apparent stimulation of the mental energies. But alcohol does not stimulate—it paralyzes the brain. As its effect continues, drunkenness ensues, with staggering gait and partial anæsthesia. Large quantities result in alcoholic coma, which must be treated like opium poisoning or poisoning with other narcotics.

The *circulation* is affected by alcohol inasmuch as its use helps the heart indirectly. It dilates some of the peripheral vessels and causes a quickened pulse. But it is not a real heart stimulant in the same sense as digitalis or caffeine.

On the *digestive system*, alcohol, well diluted and in small quantities, increases the stomach secretion and aids the movements of the stomach.

In 50 per cent. strength it is an irritant to the gastric mucous membranes.

As a *food* alcohol is burned in the body, producing heat and energy. It is a quickly absorbed food suitable only in extreme cases of exhaustion. It acts in this capacity by sparing body tissues that otherwise might be broken down to furnish heat and energy. Its general effect, however, is to cause the loss of more heat than it generates.

THERAPEUTIC USES.—Alcohol is used as a food and to assist the heart in exhausting fevers, typhoid, pneumonia, etc. In chills and threatened cold, hot whiskey dilates the vessels of the skin and gives a feeling of warmth and comfort. It is a much-used stimulant in shock and collapse from any cause.

Gastric atony is often combated by the use of some light wine with the food, or the digestive elixirs which contain 20 per cent. alcohol are used in the same condition.

The habit of alcoholism is very easily formed by neurasthenic and hysterical individuals. Many patent medicines, such as "Peruna" and the like, owe much of their popularity to the alcohol which they contain.

CHLOROFORM AND ETHER.

Both of these anæsthetics are derived from alcohol by a chemical transformation. Internally in small doses they have much the same

effect as alcohol on the brain and digestion, although their action is far more powerful. Alcohol, too, it will be remembered, produces an anæsthetic condition when taken in excessive doses.

Chloroform is used internally very often as the spirit of chloroform, the dose of which is from 1 to 2 c.c. (mxxv). The compound spirit of ether, also called Hoffman's anodyne, is given in the same dose and for the same conditions.

In *gastric flatulence* and in *certain spasmodic conditions*, such as *asthma*, both of these preparations are used. They should be given well diluted.

As *anæsthetics*, chloroform and ether are given by inhalation. Chloroform is the more effective of the two, is less irritating to the nose and throat, but collapse of the respiration and heart appears more frequently after its use than after the use of ether. From seven to ten minutes is usually required to produce complete anæsthesia. Both of these drugs may cause profound disturbance of the liver and kidney function following their use. Nausea is more frequent after ether than chloroform, but it is not unknown after the latter. *The urine should always be preserved for examination both before and after the administration of either of these anæsthetics.*

In collapse from ether or chloroform: (1) lower the patient's head and chest; (2) give artificial respiration; (3) give adrenalin, mxx , with caffeine sodium benzoate, gr.ii, or strychnine sulphate, gr. $\frac{1}{16}$, by hypodermatic injection deep in the buttock.

CHLORAL HYDRATE AND OTHER HYPNOTICS.

Chloral occurs in colorless crystals with a peculiar odor and taste. The crystals are very soluble in water.

PHYSIOLOGICAL ACTION.—In large doses, chloral has a very depressing effect on the blood-pressure, making the pulse soft and rapid. It is depressing to the heart and respiratory centre when not used with discretion. In moderate doses it produces a quiet, dreamless sleep. Nausea and depression, however, may follow this peaceful slumber. All of the reflexes are diminished by chloral, and it depresses the motor as well as the sensory part of the brain. Long-continued use may cause degenerative changes in internal organs, and even aside from this, a habit resembling alcoholism may be formed. Other and presumably safer hypnotics are:

TRIONAL AND SULPHONAL.

These, as is the case with chloral, may be given in doses of 1 Gm. (gr.xv). Veronal and chloretone have a smaller dosage, 0.5 Gm. (gr.

viii). Chloral is usually given in syrup or water; chloretone in capsule or powder; trional, sulphonal, and veronal in hot milk.

POISONING.—In poisoning by chloral or other hypnotics, wash out the stomach, keep the patient recumbent, give strong hot coffee by rectum, and strychnia sulphate, gr. $\frac{1}{30}$, by hypodermatic injection.

Bromidia, Somnos, etc., are proprietary solutions of chloral, and poisoning by them should be treated as chloral poisoning.

QUESTIONS.

1. What percentage of alcohol does whiskey contain? wines? beer and ales? What is the dose of alcohol? How does alcohol affect the brain? the circulation? Is it a real heart stimulant? How does it affect digestion?

2. What are the therapeutic uses of alcohol? Name and give dose of a preparation of ether; of chloroform. What are these preparations used for? Compare the anæsthetic action of ether and chloroform. Why is it necessary to preserve a sample of urine both before and after anæsthesia? What three things should be done in collapse during anæsthesia?

3. How does chloral occur? How does it affect the heart and respiratory centre in large doses? What is the effect of small doses? How does it affect the reflexes? What is the dose of chloral, trional and sulphonal? of chloretone and veronal? How are these drugs best given?

4. How would you treat poisoning by chloral or other hypnotics? What do Bromidia and Somnos contain?

XI. THE VASODILATORS.

AMYL NITRITE.

This is a clear yellow liquid with an unmistakable, pungent odor. It is given by inhalation in a dose of 0.18 c.c. (miii).

Spirit of nitroglycerin has an action similar to amyl nitrite. It is given by hypodermatic injection or by mouth in a dosage of about 0.0004 Gm. (gr. $\frac{1}{150}$). A tablet containing this amount is much used.

PHYSIOLOGICAL ACTION.—When amyl nitrite is inhaled or nitroglycerin given by hypodermatic injection, a flushing of the face and a throbbing of the temporal arteries occur. The pulse and respiration become hurried, and the blood-pressure falls and remains low for a little while. The effect of nitrite of amyl comes in about thirty seconds; of nitroglycerin in about ten minutes.

The lowering of the blood-pressure occurs because these drugs, being absorbed, act on the nerves and muscles in the walls of the smaller arteries, causing the muscle to relax and increasing the calibre of the vessels, especially the vessels of the abdomen and brain. It is held by some authorities that they have an opposite effect on the vessels of the lung, contracting them till they are practically bloodless. These drugs do not act on the heart. They help the

heart by lessening the pressure against which it works when that pressure is too high.

THERAPEUTIC USES.—These drugs are used in diseases accompanied by high blood-pressure—Bright's disease, uræmic coma, angina pectoris, and asthma. In pneumonia and in the hemorrhage from tuberculosis, the nitrites are also used.

XII. LOCAL ANÆSTHETICS.

COCAINE, ORTHOFORM, ETC.

Cocaine is an alkaloid obtained from coca leaves. The hydrochloride is very soluble in water, readily absorbed, and strong solutions when injected, often bring about toxic symptoms. Alpyn, eucaine, and many similar drugs are alleged to be less toxic than cocaine. Orthoform is sparingly soluble. It is used most frequently as a dusting powder for painful or itching surfaces, as it gives a prolonged action.

PHYSIOLOGICAL ACTION AND USES.—The local anæsthetics relieve pain and itching by paralyzing the terminal nerves in the tissues. Cocaine hydrochloride is frequently combined with adrenalin in solutions varying in strength from 1 per cent. to 0.1 per cent. for infiltration anæsthesia. It is also used in eye, ear, nose, and throat surgery. Five grains of cocaine hydrochloride to an ounce of normal salt solution will make a 1 per cent. solution of the alkaloid. One-

half a grain to an ounce will make 1 to 1000 strength. Five minims of adrenalin will be sufficient to add to these solutions to secure the local action of adrenalin on the blood-vessels and to prevent the absorption of the cocaine.

COCAINE POISONING.—Acute cocaine poisoning is seldom fatal. Quick pulse, increased excitability, and nervousness are the symptoms of cocaine absorption. The hydrochloride is sometimes given internally to allay vomiting, in a dose of 0.03 Gm. (gr. $\frac{1}{2}$).

Cocaine, like morphine, often makes its users the victims of an enslaving habit, and many States have laws to prevent its promiscuous sale.

XIII. URINARY DISINFECTANTS.

Urotropin, cystogen, hexamethylenamine are various names applied to a substance which is formed when formaldehyde gas is brought in contact with ammonia. This drug occurs as a white powder, soluble in water, with a not disagreeable taste. It has been found to liberate formaldehyde compounds in the urine and prevent the multiplication of bacteria in the urinary tract. Cole, of Johns Hopkins, also discovered that it produces the same effect in the fluid of the spinal canal and in the gall-bladder. No less important, Barton, of Georgetown, has proven that it is excreted in a notable amount

within a very short time after its administration in discharge from disease of the middle ear. These observations extend the field of this drug's effectiveness.

THERAPEUTICS.—Urotropin is used as a urinary antiseptic and disinfectant in renal colic, pyelitis, cystitis, and infections of the urinary tract from any cause. In suppurative gall-stone disease and meningitis it has also been used; in the former condition large doses being given after operation. Its use in ear diseases will probably cause it to be given in infectious diseases, such as scarlet fever, tonsillitis, measles, etc., to prevent ear involvement, as well as in acute and chronic forms of middle-ear disease. It is given in powder or tablet form, 0.3 to 1 Gm. (gr.v to xv), well diluted, after food.

XIV. BACTERIAL DERIVATIVES.

ANTITOXINS AND VACCINES.

When a bacterium produces an infection in an animal and proceeds to multiply and manufacture its particular poison or toxin, one of two things happens; either the bacteria increase in great numbers very rapidly and overwhelm the animal with a large amount of toxin, and death results, or they do not increase so rapidly, and the animal gradually recovers from the disease. Assuming for both animals an equal virulence

of the infection, it would seem that the "resistance" of the recovered animal was better than that of the one that died. If the body has sufficient time and vitality for the work, it will manufacture its own antitoxin and recover from the disease. The power to neutralize the poison of the disease will remain in the animal's blood for a considerable time after recovery has taken place. The practical utilization of this principle is seen in diphtheria antitoxin.

Diphtheria Antitoxin (see Part V).—This antitoxin is the purified blood serum from a horse that has been rendered immune to the disease by gradual inoculation. When this serum is injected into another animal, it renders diphtheria toxin harmless to that particular animal. Analogous preparations are used with good effect in epidemic meningitis and in tetanus.

Vaccines.—Various bacterial vaccines, being emulsions of known quantities of killed bacteria, have come into use in the last few years. Their administration is believed to stimulate the various resisting forces of the diseased body to the production of antibodies, "opsonins," etc. Those of the pus-producing organisms are the most in vogue and are used in gonorrhœal arthritis, abscesses, acne, septicæmia, etc. Typhoid vaccine is being used to produce immunity from the disease in the United States army, but its use

in treatment seems limited and uncertain. The Pasteur treatment for rabies is practically a vaccine treatment.

ADMINISTRATION.—Vaccines and serums are given by subcutaneous injection. In diphtheria, antitoxin is most frequently given between the shoulder-blades in doses of from 3000 to 10,000 units, repeated every eight hours if necessary until the temperature drops to at least 100° and other symptoms abate.

The vaccines are given with an ordinary hypodermatic syringe, from 10 to 300 millions of bacteria in each dose according to the requirements of the case, and repeated not oftener than every third day.

XV. DRUGS DERIVED FROM THE ANIMAL KINGDOM.

PEPSIN.

Pepsin occurs in the form of yellowish scales. It is obtained by scraping the lining of the pig's stomach and drying the resulting glutinous material on glass plates. It is used in combination with diluted hydrochloric acid when the stomach secretions are known to be deficient. The dose of pepsin is 0.3 to 0.6 Gm. (gr. v to x). Several palatable preparations of pepsin are largely and often needlessly used as vehicles for other medicines, as essence of pepsin, elixir of

lactated pepsin, etc. These are given in dosage of 4 to 16 c.c. (ʒi to ʒiv) after meals.

PANCREATIN.

Pancreatin is a grayish powder obtained by drying the juice of the pancreas of the pig. It is used in indigestion of intestinal origin, in doses of 0.1 to 0.3 Gm. (gr. ii to v), given two hours after meals.

THYROID EXTRACT.

Thyroid gland and its extract when given in sufficient quantities have a marked action on the circulation and nervous system, as well as on the general nutrition. The pulse is quickened, the blood-pressure falls, while tremors in the limbs, loss of appetite, and diarrhoea, loss of flesh, excessive perspiration, and thirst are not unusual symptoms. Sugar and albumin often are found in the urine after thyroid treatment. The dried gland is used in medicine in dosage of 0.2 to 0.3 Gm. (gr. iii to v). Iodothyrim, an iodine compound, is believed to represent the active principle of the gland.

THERAPEUTICS.—The dried gland is administered when, through disease or other injury, the normal secretion of the thyroid gland is lessened in amount. It seems that this gland gives to the blood substances necessary to the proper nutrition and nervous tone of our bodies.

Certain rare forms of goitre and the diseases known as cretinism and myxoedema are conditions in which thyroid treatment accomplishes good results. Many advertised obesity cures contain thyroid extract. Its indiscriminate use, however, is dangerous, and it is also not very effective in reducing weight.

PART IV.

HYPODERMATIC AND RECTAL MEDICATION.

THE HYPODERMATIC METHOD.

IN administration of medicines under the skin, every precaution should be taken to insure perfect cleanliness of the skin, the instrument, and the needle.

1. Scrub the skin well, preferably the outer part of the arm, with soap and water, followed by alcohol, or at least with alcohol alone.

2. Place the needle in a teaspoon filled with water and boil it for two minutes over a flame from a stove or gas jet.

3. Draw the hot water into the barrel of the syringe and return it to the spoon several times, to clean the syringe barrel. Boil the water again for a minute, fill the syringe barrel with it, and hold the latter in one hand while the spoon is emptied of the remaining water, leaving the needle.

4. Screw the needle into the syringe barrel, being careful to hold the former by its base and not to touch the needle proper.

5. Lay the syringe down in such a manner that its point will not be soiled, place a hypodermatic tablet in the spoon, and expel the

water in the syringe on the tablet. Boil the solution for a minute and draw it into the syringe.

6. Hold the syringe, *needle up*, and push the piston until the air is expelled from the needle and a well-formed drop appears at the tip. Pinch up a portion of the cleaned skin which does not show any veins, insert the needle with a quick sure movement *under* the fold of skin so raised, and expel the contents slowly, gently massaging the elevation produced.

7. Withdraw the needle and rinse both it and the syringe in water, followed by alcohol.

Medicines frequently given by the hypodermatic method are the salts of atropine, caffeine, strychnine, sparteine, morphine, heroin, codeine, hyoscine, pilocarpine, physostigmine, cocaine, apomorphine, and quinine; camphorated oil, extract of ergot, strophanthin, nitroglycerin, ether, and brandy. Normal salt solution and the various vaccines and antitoxins are given in this way, but not in the ordinary small syringe.

ENEMATA.

Two kinds of enemata are given; the *nutritive*, to be retained and absorbed; the *purgative*, to stimulate the action of the bowels and cause expulsion of the intestinal contents. *Rectal irrigations* are in the nature of enemata, but in this treatment the fluid is allowed to run till a sufficient quantity to wash the bowel has entered,

and then it is allowed to return through the same or another tube.

Enemata may be either *high* or *low*. The former can be given through a long soft rubber rectal tube, which passes into the large bowel for six inches or more. The low enema may be given with an ordinary hard rubber tip just reaching into the rectum. As the lower portion of the rectum is very sensitive, low enemata are expelled more rapidly than high ones.

Nutritive Enemata.—A typical nutritive enema is the following:

Beat up an egg and add it to half a pint of milk. Warm to blood-heat and add the contents of a peptonizing tube (Fairchild's). Set aside in a warm place for an hour. A tablespoonful of brandy or of sugar may be added. Half of this quantity should be given by high rectal enema every three hours, having first irrigated the bowel with salt solution.

Purgative Enemata.—A much used enema is the ordinary soapsuds (SS.) enema. It is given hot, about a quart being used for an adult, and turpentine, $\mathfrak{z}\text{i}$ to $\mathfrak{z}\text{iv}$, is often added.

Glycerin is often added to water or suds as an enema. One-half an ounce of glycerin added to one or two ounces of hot water is used as a purgative enema for infants.

The 1-2-3 enema, a powerful irritating compound, is often used in hospitals. It consists of

Epsom salt $\mathfrak{z}\text{i}$, glycerin $\mathfrak{z}\text{ii}$, water $\mathfrak{z}\text{iii}$,—with or without turpentine, one or two teaspoonfuls.

One pint each of molasses and milk with turpentine, a tablespoonful, is credited by some surgeons with special virtue in abdominal distention following operation. A cleaner preparation consists in beating up an egg, adding turpentine 1 teaspoonful, drop by drop, glycerin 3 ounces, and soapsuds to make a pint. In both of these formulas, the object is to emulsify the turpentine in order to get its full effect.

Oil enemata are often used in chronic constipation. Olive or cottonseed oil, warmed, is given high in quantities of from 4 to 6 ounces in the evening, the patient remaining on his face with hips elevated for half an hour afterwards in order to retain the oil.

Starch water enemata, 1 to 2 ounces, with opium in proper dosage, are often given to children with diarrhoea and irritable rectum. Strained gruel may be used instead of starch water with good effect.

THE PREPARATION OF ANTISEPTIC AND OTHER SOLUTIONS.

The nurse is very often called upon to prepare solutions of various chemicals in water for use in medicine and surgery. She may be told: (1) to make a solution of a certain percentage strength; (2) to make a solution of a certain

number of parts to 1000 parts, or (3) to make a saturated solution. A *saturated* solution is reached when the liquid will not dissolve any more of the chemical substance. Various salts have various rates of solubility in water—thus iodide of potassium will dissolve in less than its own weight of water, while boric acid requires about eighteen times its own weight to make a solution. Heat will make a sparingly soluble salt more soluble, but the excess over the normal amount will fall as a sediment when the solution cools. The addition of more soluble salts to the less soluble will make the latter dissolve more readily,—for instance, mercury bichloride, soluble one part in twenty of water, will, on the addition of ammonium chloride, become soluble in proportion of two parts to twenty of water.

The drugs usually employed in percentage strengths are carbolic acid, lysol, formaldehyde, argyrol, nitrate of silver, cocaine hydrochloride, sodium chloride (salt), and boric acid.

RULE FOR PREPARING PERCENTAGE SOLUTIONS (1 or more to 1000).

To make a litre of 1000 c.c. of a solution of any drug, place a cipher after the required percentage, thus multiplying it by 10. This will give the number of grammes if a solid, or cubic centimetres if a liquid, to be added to 1000 c.c.

EXAMPLE.—Prepare 1 litre of a 5 per cent. solution of carbolic acid. The required percentage, 5, with a cipher added becomes 50. Therefore, 50 c.c. will be added to 1000 c.c. of water to make a 5 per cent. solution.

To make 1 litre of 0.9 per cent. (normal) salt solution, 0.9 multiplied by 10 equals 9.0, or 9.0 Gm. to 1000 c.c. equals 0.9 per cent.

RULE FOR PREPARING DILUTIONS OF 1 TO 1000
OR OVER.

To make a litre of a solution of a chemical in 1 to 1000 solution or greater, take the figure representing the number of thousands required (as 2, if the dilution required be 1-2000), and divide it into 100. The result will be the number of centigrammes or one hundredths of a cubic centimetre required.

EXAMPLE.—Make a 1-5000 solution of mercury bichloride. 5 into 100 equals 20; 0.20 Gm. is the amount of bichloride required to make 1 litre of solution.

A solution of mercury bichloride to which ammonium or sodium chloride is added, of strength of 1 to 10, is often used for convenience; 100 c.c. of this solution contains 1 Gm. of the chemical, so 10 c.c. to 1 litre gives a 1 to 1000

solution. The 2, 3, 4, 5, or 10 thousand dilution required may be obtained by dividing the 2, 3, 4, 5, or 10 into 10 c.c., and adding the resulting number of c.c. of the solution to 1 litre of water.

In the old system, 1 teaspoonful to a quart makes about 1 to 250; to 2 quarts, 1 to 500.

Remedies frequently employed in solution strengths of 1 to 1000 and over are: Bichloride of mercury, permanganate of potash, argyrol, nitrate of silver, iodine, and formaldehyde.

PART V.

A REFERENCE LIST OF COMMONLY USED DRUGS, CHEMICALS, PROPRIETARY MEDICINES.

THIS list includes official drugs and preparations, and also a number of preparations made by private concerns which have a more or less wide use. In this list, the therapeutic indications of the remedies are given as *recommended* by various writers, and no attempt has been made to reconcile the therapeutic indications with the physiological action of each remedy, as is done in the first portion of this book. The writer does not guarantee the claims made for these preparations: they are given simply for reference. Proprietary preparations have a "P" following the name.

ACETANILID.

Phenylacetamide. Antifebrin. White scales of powder; odorless; burning taste. Soluble in about 200 parts of water, 5 of alcohol. Antipyretic; analgesic; antirheumatic; antiseptic. Uses: *internally*, fever, rheumatism, headache, neuralgia, etc.; *externally*, like iodoform and as a preservative of hypodermatic solutions (1:500). Dose: 3-10 gr. (0.2-0.6 Gm.), in powder, alcoholic solution, or hot water cooled down and sweetened to taste; maximum dose, 10 gr. (0.6 Gm.) single; 30 gr. (2 Gm.) daily.

ACID, ACETIC, GLACIAL.

Caustic (in warts or corns) and vesicant. Not used internally. Antidote: magnesia, chalk, soap and water, lime water, milk, oil, etc.

ACID, ACETIC. (36 per cent.) (U. S. P.)

Refrigerant, astringent. Uses: chiefly externally as an inhalant in syncope, asphyxia, and headache, and as application as a rubefacient. Dose: 15-40 minims (1-2.5 c.c.) well diluted.

ACID, ACETIC. DILUTED. (6 per cent.)

Dose: 2-4 fldr. (8-15 c.c.).

ACID, AGARICIC.

Agaric, or agaricinic acid. Powder; odorless; almost tasteless. Soluble slightly in water; in boiling alcohol and water. Antihydrotic. Uses: night-sweats of phthisis. Dose: $\frac{1}{4}$ - $\frac{1}{2}$ gr. (0.01-0.03 Gm).

ACID, ARSENOUS.

White powder or lumps; odorless; tasteless. Soluble in about 100 parts of water; aqueous solubility is increased by tartaric or hydrochloric acid. Antiperiodic; alterative. Uses: *internally*, malarial fever, skin diseases, chorea, neuralgia, gastralgia, diabetes, phthisis; *externally*, to remove warts, cancers, etc. Dose: $\frac{1}{10}$ - $\frac{1}{20}$ gr. (0.001-0.003 Gm.) 4 times daily. Maximum dose: about $\frac{1}{2}$ gr. (0.005 Gm.) single; about $\frac{1}{4}$ gr. (0.001 Gm.) daily. Preparation: solution of 1 per cent.

ACID, BENZOIC.

Pearly plates or needles; aromatic odor; warm acid taste. Soluble in about 2 parts of alcohol and 500 of water. Borax or sodium phosphate increases the solubility in water. Antiseptic; diuretic; expectorant. Uses: *internally*, to acidify phosphatic urine, to reduce acidity of uric acid urine, to control urinary inconti-

nence, also in chronic bronchitis and jaundice; *externally*, wound dressing (1-100), in urticaria, etc. Dose: 10-30 gr. (0.6-2 Gm.) six times daily.

ACID, BORIC.

Soluble in about 18 parts of water, 15 of alcohol. Antiseptic; preservative. Uses: *internally*, cystitis; tuberculosis; diarrhoea; and diphtheria, and abnormal gastric fermentations; *externally*, as a dressing for wounds and sores in 5-10 per cent. petrolatum ointment, as insufflation in powder form, in eye lotions, and in nasal and aural washes in 1-4 per cent. aqueous solution, in ringworm, eczema, and other skin diseases. Dose: 5-15 gr. (0.3-1 Gm.). Preparation: liquor antisepticus.

ACID, CARBOLIC.

Phenol. Soluble in about 15 parts of water; freely in alcohol. Antiseptic; antipyretic; caustic; topical anæsthetic. Uses: For making disinfecting solutions, aborting boils and carbuncles, as application to ulcers, venereal sores, nævi, hemorrhoids, toothache, diphtheria, etc. Dose: $\frac{1}{2}$ -2 gr. (0.03-0.12 Gm.) well diluted or in pills. Injection into urethra or bladder in solution of 1:2-1000; as wash, 1-3:500; as caustic, pure or concentrated. Preparations: glycerite (20 per cent.); ointment (5 per cent.).

ACID, CHROMIC.

Small dark purplish red, deliquescent needles or pencils. Soluble freely in water. Astringent; caustic. Uses: *externally*, in syphilitic ulcers, hyperplasia or ulcers, condylomata, exuberant granulations, hemorrhage, sweating feet, leucorrhœa, etc. Application, as caustic in 20 per cent. solution; for sweating feet, 5 per cent. solution.

ACID, CITRIC.

Soluble freely in water, alcohol, or glycerin. Antiseptic; antiscorbutic; refrigerant. Uses: *externally*, pru-

ritus; diphtheria, angina, or gangrenous sore mouth; *internally*, cooling beverage to assuage fever, and as remedy in scurvy.

ACID, GALLIC.

Whitish interlaced needles; odorless; astringent; slightly acidulous taste. Soluble in about 100 parts of water and 5 of alcohol. Antisudorific; hemostatic; astringent; antiseptic. Uses: *externally*, epistaxis, alopecia, purpura, menorrhagia, and hemorrhoids; *internally*, hæmatemesis, hæmaturia, night-sweats, pyrosis, and intestinal hemorrhage. Preferred to tannin in action; does not constipate. Dose: 5-20 gr. (0.3-1.3 Gm.).

ACID, HYDROBROMIC.

Nervine. Uses: in nervous affections; vomiting, whooping-cough, bronchial and nasal catarrhs, cerebral hyperæmia, epilepsy, muscular spasm, hemiplegic chorea, neuralgia, tinnitus, and headache after quinine, etc. Dose: 30-90 minims (2-6 c.c.) in sweetened water.

ACID, HYDROCHLORIC. (31.9 per cent. HCl.)

Antiseptic, antipyretic; and caustic. Uses: *internally* in fevers, dyspepsia, syphilis, eczema, psoriasis, etc.; *externally*, in mouth washes and gargles in 1-2 per cent. solution. Dose: 5-10 minims (0.3-0.6 c.c.) well diluted.

ACID, HYDROCHLORIC. DILUTED. (10 per cent.)

Dose: 10-30 minims (0.6-2 c.c.) well diluted in sweetened water.

ACID, HYDROCYANIC. DILUTED. (2 per cent. HCN.)

Antispasmodic. Uses: *internally*, to allay pain and spasms, relieve nervous cough, palpitation, and painful affections of the stomach, vomiting and whooping-cough; *externally*, to control itching of the skin. Dose: 2-5 minims (0.12-0.3 c.c.); maximum dose, 10 minims (0.6 c.c.); *externally*, 1.8-16 as lotion. Only on unbroken skin.

ACID, HYDRIODIC.

Deep brown fuming liquid. Antirheumatic; alterative. *Uses:* rheumatism, bronchitis (acute or chronic), asthma, syphilis, obesity, psoriasis, to eliminate mercury or arsenic from the system, etc. *Dose:* 5-10 minims (0.3-0.6 c.c.) well diluted with sweetened water, after meals. *Preparation:* syrup, 4 c.c. (3i).

ACID, HYPOPHOSPHOROUS. DILUTED. (10 per cent.)

Stimulant and tonic in nervous disease. *Dose:* 10-60 minims (0.6-4 c.c.).

ACID, LACTIC. (75 per cent.)

Caustic; astringent; digestive. *Uses:* mostly *externally* in carcinoma, croup, etc.; *internally*, dyspepsia, diarrhoea, diabetes, etc. *Dose:* 15-30 minims (1-2 c.c.), well diluted. Applied externally, 50-80 per cent. paint.

ACID, NITRIC. (68 per cent. HNO_3 .)

Uses: *externally*, as caustic and stimulant in foot baths (30-50 Gm.); also as paint for frost-bites; as an escharotic, applied pure; *internally*, in lepra. Very little used. *Dose:* 1-5 drops in mixtures well diluted.

ACID, NITRIC. DILUTED. (10 per cent. HNO_3 .)

Tonic; antiseptic; astringent. *Uses:* intestinal indigestion, syphilis, chronic hepatitis. *Dose:* 5-30 drops (0.3-2 c.c.) well diluted.

ACID, NITROHYDROCHLORIC. DILUTED.

One-fifth strength of concentrated, which is not used therapeutically. *Uses:* *internally*, jaundice, biliary calculi, dyspepsia, chronic rheumatism, etc.; *externally*, diluted as sponge or foot bath, two or three times a week. *Dose:* 5-20 minims (0.03-1.3 c.c.) well diluted.

ACID, OXALIC.

Transparent crystals; very acid taste. Soluble in water and alcohol. Emmenagogue; sedative. **Uses:** functional amenorrhœa, acute cystitis. **Dose:** $\frac{1}{2}$ -1 gr. (0.03-0.06 Gm.) every 4 hours in sweetened water. **Antidotes:** calcium saccharate, chalk, lime water, magnesia.

ACID, PHOSPHORIC. DILUTED. (10 per cent.)

Tonic and refrigerant. **Uses:** dyspepsia, scrofula, caries, night-sweats of phthisis, disturbances of nutrition of the teeth, etc. **Dose:** 20-60 minims (1.3-4 c.c.).

ACID, PICRIC.

Picronitric, picrinic, or carbazotic acid. Yellow crystals; odorless; intensely bitter. Slightly soluble in water and alcohol. Antiseptic; astringent. **Uses:** *internally*, in trichiniasis, etc.; *externally*, burns, $\frac{1}{2}$ -1 per cent. hydro-alcoholic solutions for 5 minutes then dressing with cotton (to be renewed only every 7 or 10 days); sore nipples, $\frac{1}{10}$ per cent. solution; eczema, etc. $\frac{1}{3}$ - $\frac{2}{3}$ per cent. solution as paint. **Dose:** $\frac{1}{2}$ -2 gr. (0.03-0.12 Gm.) in alcoholic solution; maximum daily dose, 5 gr. (0.3 Gm.). **Antidote:** albumin.

ACID, PYROGALLIC.

Pyrogallol. Soluble in about 2 parts of water and 1 of alcohol. Used only externally, usually in 5-10 per cent. ointment, in psoriasis and other cutaneous affections.

ACID, SALICYLIC.

Soluble in about 308 parts of water and 2 $\frac{1}{2}$ of alcohol; 20 gr. are rendered soluble in 1 ounce of water by the addition of 25 gr. of borax or 40 gr. potassium citrate. Antiseptic; antirheumatic; antipyretic; antineuralgic. **Uses:** *internally*, in rheumatism, migraine, neuralgia, and febrile infectious diseases; *externally*, in 2-5 per cent. alcoholic solution or mixed with talcum, for perspiring feet. **Dose:** 10-40 gr. (0.6-2.6 Gm.).

ACID, SULPHURIC, AROMATIC. (20 per cent. H_2SO_4 .)

Best form for administration. **USES:** like the diluted acid. **DOSE:** 10-20 minims (0.6-1.3 c.c.).

ACID, SULPHURIC. DILUTED. (10 per cent. H_2SO_4 .)

Concentrated sulphuric acid is not used medicinally. **USES:** *internally*, gastro-intestinal disorders, phthisical sweats, exophthalmic goitre, etc.; also as solvent for quinine sulphate, etc. **DOSE:** 15-30 minims (1-2 c.c.), well diluted.

ACID, SULPHUROUS.

Aqueous solution containing 6.4 per cent. Antiseptic; antizymotic. **USES:** *externally*, by inhalation in bronchial affections and whooping-cough; *internally*, in typhoid and dyspepsia. **DOSE:** 15-60 minims (1-4 c.c.), well diluted; *externally*, 10-25 per cent. solution.

ACID, TANNIC.

Soluble in about 1 part of water or alcohol. Astringent; styptic, antiseptic. **USES:** *externally*, in hemorrhages, applied pure, as enema, in 1-10 per cent. solution in mouth washes, gargles, collyria, injections, inhalations, and as application wherever a powerful astringent action is desired; *internally*, in diarrhoea, renal hemorrhage, and night-sweats. **DOSE:** 2-20 gr. (0.12-1.3 Gm.). Preparations: styptic collodion (20 per cent.); glycerite (20 per cent.); ointment (20 per cent.); troches 1 gr.

ACID, TARTARIC. (Crystals or powder.)

Soluble in about 1 part of water and 3 of alcohol. Refrigerant and antiscorbutic. **DOSE:** 10-30 gr. (0.6-2 Gm.).

ACID, TRICHLORACETIC.

Deliquescent crystals; pungent suffocating odor; caustic. Freely soluble in water and alcohol. Escha-

rotic; astringent; hæmostatic. **Uses:** venereal and cutaneous warts, papillomata, vascular nævi, pigmented patches, corns, nasopharyngeal affections, and indolent ulcers. Applied, as escharotic, pure or in concentrated solution; astringent and hæmostatic, 1-3 per cent. solution. **Antidotes;** same as for mineral acids.

ACONITE ROOT.

Uses: see Part II. **Preparations:** extract. **Dose:** $\frac{1}{4}$ - $\frac{1}{2}$ gr. (0.015-0.03 Gm.), fluidextract, dose $\frac{1}{4}$ -1 minim (0.015-0.06 c.c.); tincture, 1-3 minims (0.06-0.2 c.c.).

ADRENALIN. P. (See Part II.)

Blood-pressure raising principle of suprarenal gland. Hæmostatic and astringent. **Used** in 1:10,000-10:10,000 solution (as chloride) in hay fever, inflammation of tonsils, larynx, etc., and in conjunctivitis, iritis, etc. **Dose:** 1 c.c. (m $\times$ v) by hypodermatic injection.

AGARICIN.

Yellowish powder; sweet, with bitter after-taste. Soluble in alcohol and slightly in water. Antihydrotic. **Uses:** phthisical night-sweats, sweating from drugs. **Dose:** $\frac{1}{4}$ -1 gr. (0.015-0.06 Gm.).

AGURIN. P.

Acet-theobromine sodium. White hygroscopic powder. Soluble in water. Diuretic. **Uses:** cardiac and renal diseases. **Dose:** 8-15 gr. (0.5-1 Gm.) 3 to 4 times a day.

ALCOHOL. (91 per cent. C₂H₅O.)

Specific gravity 0.820. Stimulant; irritant. **Uses:** *internally*, low fevers, debility from acute diseases, aid to digestion, to warm the chilled, and as an antidote to poisoning by carbolic acid; *externally*, hardening the skin, removing desiccated epithelium, antiseptic application in wounds, and application in liniments, etc. **Dose:** 1-4 fldr. (4-15 c.c.), with 2-6 times the volume

of water. Antidotes: cold douche, stomach siphon, fresh air, ammonia, atropine or belladonna, hot-water bags, ice to the head, irritants, etc.

ALETRIS, CORDIAL. P.

Tonic and diuretic. Dose: 1 fldr. (4 c.c.) 3 or 4 times daily.

ALKALITHIA. P.

Uric acid solvent. Dose: heaping teaspoonful 3 or 4 times daily, in warm water.

ALOES, SOCOTRINE.

Cathartic; drastic; emmenagogue; vermifuge, stomachic. Uses: costiveness, atonic dyspepsia, amenorrhœa. Dose: 2-10 gr. (0.12-0.6 Gm.). Preparation: extract, dose, 1-5 gr. (0.06-0.3 Gm.).

ALOES, PURIFIED.

From socotrine aloes. Uses: like socotrine aloes. Dose: 1-10 gr. (0.06-0.5 Gm.). Preparations: pills, 2 gr. (0.12 Gm.); pills, aloes and asafetida; pills, aloes and iron; pills, aloes and mastic; pills, aloes and myrrh; tincture, dose 15-60 minims (1-4 c.c.); tincture aloes and myrrh, dose $\frac{1}{2}$ -2 fldr. (2-8 c.c.).

ALLOIN.

Barbaloin. Soluble in about 60 parts of water and 20 of alcohol. ACTION AND USES: like socotrine aloes. Dose: $\frac{1}{2}$ -2 gr. (0.03-0.12 Gm.); maximum dose, 4 gr. (0.25 Gm.), single; 10 gr. (0.6 Gm.), daily. Injection $\frac{1}{4}$ gr. (0.045 Gm.) dissolved in formamide.

AMMONIA WATER. (10 per cent. NH_3)

Rubefacient; stimulant. Uses: *internally*, stimulant in collapse and fainting; *externally*, by inhalation in fainting, in combination with carbolic acid in coryza, as an antidote in poisoning with chlorine gas; as application in form of wash and compresses in stings of

poisonous insects; in rheumatic pains and neuralgias, in form of liniment (1:10-5:10 per cent. of lanum, oil or fat). Subcutaneously as stimulant (1:10) in collapse. Dose: 10-30 minims (0.6-2 c.c.). Preparations: liniment (3 per cent. NH_3); aromatic spirits 1-2 fldr. (4-8 c.c.).

AMMONIA WATER, STRONGER. (28 per cent. NH_3 .)

Dose: 4-10 minims (0.25-0.6 c.c.) well diluted. Antidotes: vinegar; vapor of acetic acid or chlorine water by inhalation. Preparations: spirit, 10-30 minims (0.6-2 c.c.).

AMMONIUM BENZOATE.

Soluble in about 6 parts of water and 28 of alcohol. Expectorant; antiseptic; antipyretic; diuretic. Uses: in bronchitis, asthma, gastro-intestinal disturbances, rheumatism, gout, and nephritis. Dose: 10-30 gr. (0.6-2 Gm.) 3 or 4 times daily in syrup or water.

AMMONIUM BROMIDE.

Soluble in about 2 parts of water, 30 of alcohol. Sedative. Uses: epilepsy, delirium tremens, nervous headache, etc. Dose: 15-30 gr. (1-2 Gm.).

AMMONIUM CARBONATE.

Soluble in about 5 parts of water, 200 of alcohol. Rubefacient; cardiac stimulant; expectorant. Uses: *internally*, in syncope, heart failure, pneumonia, phthisis, and hysteria; *externally*, by inhalation in fainting. Dose: 5-20 gr. (0.3-1.3 Gm.).

AMMONIUM CHLORIDE.

Slightly soluble in alcohol, in about 3 parts of water. Stimulant; expectorant. Uses: bronchial affections, hepatic congestions, muscular rheumatism. Dose: 5-20 gr. (0.3-1.3 Gm.).

AMMONIUM IODIDE.

Deliquescent, unstable powder. Soluble in about 1 part of water, 9 of alcohol. Alterative; resolvent. *Uses:* syphilis, scrofula, rheumatism, and phthisis; *externally*, in lepra and psoriasis. *Dose:* 3-10 gr. (0.2-0.6 Gm.).

AMMONOL. P.

Analgesic. *Dose:* 5-20 gr. (0.3-1.3 Gm.) 3-6 times daily.

AMYL NITRITE.

Very volatile unstable liquid. Insoluble in water; soluble in alcohol. Antispasmodic; vasodilator. *Uses:* angina pectoris, asthma, tetanus, epilepsy, syncope, dyspnoea, and as an antidote to poisoning by cocaine. *Dose:* 2-5 drops. Used mostly by inhalation.

ANALGINE. P.

Analgesic; antipyretic; nerve sedative. *Uses:* neuralgia, migraine, headache, grip, rheumatism. *Dose:* 5-10 gr.

ANTIFEBRIN. P.—See Acetanilid.**ANTIMONY AND POTASSIUM TARTRATE.**

Tartar emetic. Insoluble in alcohol, soluble in about 17 parts of water. Emetic; expectorant; diaphoretic. *Uses:* bronchial catarrh, pneumonia, pulmonary emphysema. *Dose:* alterative, $\frac{1}{30}$ - $\frac{1}{15}$ gr. (0.002-0.004 Gm.); diaphoretic and expectorant, $\frac{1}{24}$ - $\frac{1}{8}$ gr. (0.0025-0.008 Gm.); emetic, $\frac{1}{2}$ gr. (0.03 Gm.) every 20 minutes.

ANTIPYRIN.

Dimethyloxyquinizine. Soluble in about 1 part of water, 2 of alcohol. Antipyretic; analgesic; sedative; styptic; antiseptic. *Uses:* Rheumatism, diabetes, cephalalgia, lumbago, sciatica, hay fever, infantile convulsions, nervous urticaria, chorea, whooping-cough, epilepsy, pleurisy, influenza, etc. *Dose:* 10-20

LIST OF COMMONLY USED DRUGS. -125

gr. (0.6-1.2 Gm.), per enema in double the dose; *subcutaneously*, (1:1) in water, 15-30 minims (1-2 c.c.) in neuralgia, myalgia and renal and biliary colic; in hemorrhoids 2:15 ointment. Applied as styptic in 20 per cent. solution or pure.

ANTITOXIN, DIPHTHERIA.

From serum of blood of a horse that has been subjected to the toxin of diphtheria. Limpid liquid that has generally been preserved in $\frac{1}{2}$ per cent. carbolic acid or other preservative. Dose: prophylactic, 600-1000 antitoxic units; ordinary cases, 1500-2000 units; severe cases (or those seen late, or of nasal or laryngeal type), 3000-5000 units; given hypodermatically and repeated in about 12-24 hours. As much as 10,000 units have been injected at a dose.

APIOL. P.

Greenish, oily liquid. Soluble in alcohol and ether. Emmenagogue; antiperiodic. Uses: dysmenorrhœa, malaria. Dose: 5-10 minims (0.3-0.6 Gm.) 2 or 3 times daily, in capsules; in malaria 15-30 minims (1-2 c.c.).

APIOLINE. P.

Emmenagogue. Dose: 2-3 capsules.

APOMORPHINE HYDROCHLORATE.

Soluble in about 50 parts of water and 50 of alcohol. Hypnotic; emetic; expectorant. Dose: expectorant $\frac{1}{16}$ - $\frac{1}{8}$ gr. (0.001-0.003 Gm.); emetic, $\frac{1}{8}$ - $\frac{1}{4}$ gr. (0.004-0.008 Gm.). Injected, emetic, $\frac{1}{16}$ - $\frac{1}{8}$ gr. (0.003-0.006 Gm.); hypnotic, $\frac{1}{16}$ - $\frac{1}{8}$ gr. (0.0015-0.002 Gm.).

ARGONIN. P.

Silver casein compound; 4.25 per cent. silver. White powder. Soluble in hot water; ammonia increases solubility. Antiseptic. Uses: Chiefly in gonorrhœa, in 1-2 per cent. solution; also in blenorhœa neonatorum, in 3 per cent. solution.

ARGYROL. P.

Silver vitellin. Antiseptic. **USES:** like silver nitrate in diseases of the eye, throat, nose, ear, and genito-urinary organs. Application, as irrigation in endometritis, gonorrhœa, etc., in 1:1000-4:1000 solution; as injection in gonorrhœa, in 3-5 per cent. solution.

ARISTOL. P.

Dithymol diiodide; annidalin; thymotol. Reddish brown, tasteless powder, about 46 per cent. iodine. Insoluble in water, sparingly so in alcohol. Succedaneum for iodoform externally. Applied like the latter in 10 per cent. solution, ointment, suppository, etc.

ARSENAURO. P.

Alterative tonic. **DOSE:** 5-15 minims (0.3-1 c.c.), in water after meals.

ASAFETIDA.

Expectorant; stimulant; antispasmodic; emmenagogue; anthelmintic. **USES:** hysteria, convulsions, spasms, asthma, whooping-cough, catarrhs, etc. **DOSE:** 5-15 gr. (0.3-1 Gm.). Preparations: emulsion, 2-6 fldr. (8-24 c.c.); pills, 3 gr. (0.2 Gm.); tincture, 20-60 minims 1.3-4 c.c.).

ASPIRIN. P.

Acetylsalicylic acid. White needles. Soluble in 100 parts of water. Antipyretic; antirheumatic. **USES AND DOSES:** Same as sodium salicylate; best taken in capsules. Incompatible with alkalies.

ATOXYL. P.

Arsenic-acid anilid. White, crystalline, odorless powder. Soluble in water. **USES:** like all arsenicals. **DOSE:** $\frac{1}{4}$ -3 gr. (0.045-0.18 Gm.), per day subcutaneously.

ATROPINE.

White crystals. Soluble freely in alcohol and slightly in water. Antispasmodic; analgesic; mydriatic; respi-

ratory and cardiac stimulant; antisialagogue; antihydrotic. *Uses:* *internally*, antidote to pilocarpine, chloral, chloroform, hydrocyanic acid, fungus poison, and morphine; angina pectoris, shock, colliquative sweats, gastric ulcer, etc.; *externally*, ointment (1 per cent. or oleate as analgesic; mydriatic, $\frac{1}{2}$ per cent. solution). *Dose:* $\frac{1}{16}$ – $\frac{1}{8}$ gr. (0.0005–0.001 Gm.); maximum dose, $\frac{1}{8}$ gr. (0.001 Gm.) single; and $\frac{1}{16}$ gr. (0.003 Gm.) per day.

ATROPINE SULPHATE.

Soluble in $\frac{1}{2}$ part of water, 6 parts alcohol. *Uses and dose:* Same as of atropine.

BALSAM PERU.

Dark, molasses-like liquid; aromatic odor. Insoluble in water, soluble in absolute alcohol. Expectorant; stimulant; stomachic; antiseptic. *Uses:* *internally*, chronic catarrh, gonorrhœa, leucorrhœa, etc.; *externally*, tuberculous affections of bone, skin, etc., chronic indolent ulcers, scabies, sore nipples, lice, chillblains, etc. *Dose:* 15 gr. (1 Gm.).

BELLADONNA LEAVES.

Preparations: extract, 0.01 Gm. (gr. $\frac{1}{8}$); tincture (10 per cent.) 0.5 c.c. (gr. viii); ointment, 10 per cent.; plaster 30 per cent.

BELLADONNA ROOT.

Preparations: fluidextract, 0.05 c.c. (℥ i); liniment, 95 per cent. of fluidextract, 5 per cent. camphor.

BENZOIN.

Preparations: tincture (20 per cent.) 1 c.c. (15 minims); compound tincture (10 per cent.) 2 c.c. (℥ xxx); benzoinated lard.

BISMUTH BETA-NAPHTHOLATE. P.

Orphol. Grayish-yellow powder becoming darker in time. Insoluble in water, slightly so in alcohol. 76–77 per cent. BiO. Intestinal antiseptic like salol. *Dose:*

0.3-1 Gm. (5-15 gr.) 3-5 times daily, in tablet or powder; children, 0.12-0.3 Gm. (2-5 gr.).

BISMUTH CITRATE.

White, odorless and tasteless powder. Insoluble in water and alcohol. Stomachic and astringent. *USES:* diarrhoea, dyspepsia, etc. *DOSE:* 0.125 Gm. (gr. ii).

BISMUTH, FORMIC IODIDE. P.

Mixture of formaldehyde, gelatin, thymol iodide, and bismuth suboxide. Surgical antiseptic; astringent; alterative, analgesic: *USES:* as a stimulant dry dressing to wounds, ulcerations, and skin diseases.

BISMUTH SALICYLATE.

White, odorless, tasteless powder. Insoluble in water or alcohol. External and internal intestinal antiseptic and astringent. *USES:* *internally*, phthisical diarrhoea, summer complaint, typhoid fever, etc.; *externally*, like iodoform. *DOSE:* 0.3-1 Gm. (5-15 gr.).

BISMUTH SUBCARBONATE.

White, insoluble powder. Stomachic astringent. *USES:* *internally*, diarrhoea, vomiting, and disordered condition of the alimentary canal; *externally*, face powder, etc. *DOSE:* 0.5 Gm. (gr. viii).

BISMUTH SUBGALLATE.

Dermatol. Odorless yellow powder. Insoluble in water or alcohol. Siccative antiseptic, and substitute for bismuth subnitrite internally. *USES:* *externally*, on wounds, ulcers, eczemas, etc.; *internally*, in gastrointestinal affections. *DOSE:* 0.25 Gm. (gr. iv) several times daily. Incompatible with acids.

BISMUTH SUBNITRATE.

White, heavy, insoluble powder. Insoluble in water. Antiseptic; astringent. *USES:* *internally*, in acute gastric affections, intestinal catarrh, dysentery, round gastric ulcer, etc.; *externally*, in eczema, ulcers, and

LIST OF COMMONLY USED DRUGS. 129

fissures as dusting powder; in gonorrhœa in aqueous suspension as injection. Dose: 0.5 Gm. (gr. viii).

BISMUTH AND AMMONIUM CITRATE.

Soluble in water, slightly in alcohol. Stomachic and astringent. Uses: in dyspepsia, gastric disturbances, and diarrhœa; *externally* as urethral wash in gonorrhœa in 1:2000-500 solution. Dose: 0.12-0.3 Gm. (gr. ii-v).

BLACK HAW.

Viburnum prunifoliorum. Nervine; oxytocic; astringent. Preparation: fluidextract, 2 c. c. (℥ xxx).

BOROLYPTOL. P.

Antiseptic. Dose: 2-4 c.c. ($\frac{1}{2}$ -1 fldr.), diluted; *externally*, in 5-50 per cent. solution.

BROMIDIA. P.

Hypnotic; sedative. Dose: 4-8 c.c. (1-2 fldr.).

BROMINE.

Soluble in alcohol, and in about 30 parts of water. Antiseptic; disinfectant. Uses: *externally*, caustic, pure or in 1.5-10 per cent. solution; by inhalation, as spray, in form of mixture of bromide solution and potassium bromide each 0.2 parts, with water 100 parts, in diphtheria and croup; *internally*, rarely in diphtheria in dose of $\frac{1}{4}$ - $\frac{1}{2}$ minims (0.005-0.02 c.c.) several times a day. Dose: 0.06-0.2 Gm. (℥ i-iii) well diluted.

BROMOFORM.

Heavy liquid, odor and taste similar to chloroform; darkens on exposure. Soluble in alcohol, insoluble in water. Antispasmodic; sedative. Uses: chiefly in whooping-cough. Dose: 0.2 c.c. (℥ iii).

BUCHU.

Stimulant; tonic, diuretic; diaphoretic. Uses: diseases of kidney, bladder, urethra, etc. Preparation: fluidextract, 2 c.c. (℥ xxx).

CAFFEINE.

Theine, Guaranine. White needles, bitter taste. Soluble in about 80 parts of water, solubility is increased by addition of sodium benzoate or salicylate. Diuretic; cardiac and cerebral stimulant; muscle invigorator. **USES:** nervous headache, neuralgia, heart failure, cardiac dropsy, nephritis, collapse, senile pneumonia, enteritis, etc. **DOSE:** 0.065 Gm. (gr. i); maximum; 0.6 Gm. (gr. x) single; 2 Gm. (gr. xxx) daily.

CAFFEINE, CITRATED.

Improperly called "citrate of caffeine"; 50 per cent. caffeine. White powder with an acid taste. Soluble in about 25 parts of water. **USES:** as in caffeine. **DOSE:** 0.125 Gm. (gr. ii).

CAFFEINE AND SODIUM BENZOATE.

45.8 per cent. caffeine. White powder. Soluble in about 2 parts of water. **USES:** by injection, 2-10 gr. (0.12-0.6 Gm.).

CALCIUM BROMIDE.

White granules, very deliquescent; sharp, saline taste. Freely soluble in water and alcohol. Nerve sedative like potassium bromide. **USES:** epilepsy, hysteria, etc. **DOSE:** 1 Gm. (gr. xv).

CALCIUM CARBONATE, PRECIPITATED.

Precipitated chalk. Antacid. **USES:** diarrhoea and acid conditions of intestine and stomach. **DOSE:** 1 Gm. (gr. xv).

CALCIUM CARBONATE, PREPARED.

Drop chalk. **USES AND DOSE:** as precipitated chalk. Preparations: compound powder, 0.6-2 Gm. (gr. x-xxx); mercury with chalk, 0.2-0.6 Gm. (gr. iii-x); chalk mixture, 4-16 c.c. (1-4 fldr.); troches, 0.25 Gm. (gr. iv).

CALCIUM CHLORIDE.

Colorless, deliquescent crystals. Soluble in about 2 parts of water, 8 of alcohol. Internally in large doses, 1.2-2.3 Gm. (gr. xviii-xxxv), 3 times a day in chronic itching; also internally and externally in hemorrhages. Dose: 0.5 Gm. (gr. viii) 3 times daily in solution, in rhachitis and arthritis.

CALUMBA.

Columbo. Bitter tonic. Uses: dyspepsia, debility, flatulence. Dose: 2 Gm. (dr. ss). Preparations: fluidextract, 2 c.c. (fldr. ss); tincture (20 per cent.), 4 c.c. (fldr. i).

CAMPHOR.

Soluble in about 1 part of alcohol; insoluble in water. Stimulant; diaphoretic; sedative; carminative; expectorant; antiseptic; analgesic; antipruritic. Uses: nervous diarrhoea, flatulence, colic, headache, chorea, cramps, asthma, collapse, spasmodic cough, etc. Dose: 0.125 Gm. (gr. ii); maximum dose, 1.3 Gm. (gr. xx). Preparations: cerate (1:50); liniment, (1:5); spirits, 1 c.c. (m xv); water, as vehicle.

CAMPHOR, MONOBROMATED.

Soluble in alcohol, almost insoluble in water. Soporific; antineuralgic; antispasmodic. Uses: delirium tremens, hysteria, insomnia, whooping-cough, epilepsy, neuralgia, chorea, etc. Dose: 0.125 Gm. (gr. ii), in pill or emulsion; injection, 1½ gr. (0.1 Gm. in oil.)

CANNABIS INDICA.

Indian hemp. Narcotic; sedative; analgesic; aphrodisiac. Uses: headache, summer diarrhoea, anorexia, neuralgia, rheumatism, chorea, hysteria, mental depression, delirium tremens, etc. Preparations: extract, 0.01 Gm. (gr. ¼); fluidextract, 0.05 Gm. (m i); tincture (10 per cent.), 1 c.c. (m xv).

CANTHARIDES.

Irritant; vesicant; diuretic; aphrodisiac; rubefacient. Uses: *internally*, lupus, tuberculosis; *externally* neuralgia (as vesicant), and for promoting growth of hair. Dose: 0.03 Gm. (gr. $\frac{1}{2}$). Preparations; cerate (32 per cent.); collodion; tincture (10 per cent.), 0.3 c.c. (℥ v).

CAPSICUM.

Cayenne pepper; African pepper. Rubefacient; stimulant; carminative. Uses: *internally*, diarrhoea, dyspepsia, colic, alcoholism, etc.; *externally*, rheumatism, neuralgia, lumbago, etc. Dose: 0.065 Gm. (gr. i). Preparations: oleoresin, 0.03 Gm. (gr. $\frac{1}{2}$); fluidextract, 0.05 c.c. (℥ i); tincture, (10 per cent.) 0.5 c.c. (℥ viii); plaster.

CARDAMOM.

Carminative; aromatic tonic. Dose: 1 Gm. (gr. xv). Preparations: tincture (20 per cent.), 4 c.c. (fldr. i); compound tincture (2.5 per cent.) 4 c.c. (fldr. i).

CASCARA SAGRADA.

Laxative; cathartic; hepatic; intestinal tonic. Uses: chronic constipation, rheumatism. Preparations: extract, 0.25 Gm.; fluidextract, 1 c.c. (℥ xv); aromatic fluidextract, 1 c.c. (℥ xv).

CATECHU (Gambir).

Astringent; hæmostatic. Uses: diarrhoea, leucorrhœa, gonorrhœa, gleet, hemorrhage, relaxed uvula, spongy gums, etc. Dose: 1 Gm. (gr. xv). Preparations: compound tincture (5 per cent.), 4 c.c. (fldr. i); troches (0.06 Gm. each).

CERIUM OXALATE.

White powder, odorless and tasteless. Insoluble in water and alcohol. Sedative. Uses: vomiting of pregnancy, sea-sickness, gastric crises in tabes, migraine, chronic diarrhoea. Dose: 0.065 Gm. (gr. i), maximum dose, 0.3 Gm. (gr. v), single; 1 Gm. (gr. xv) daily.

CHALK.—See Calcium Carbonate.

CHARCOAL.

Wood charcoal. **Uses:** dyspepsia, flatulence, etc.
Dose: 1 Gm. (gr. xv). Incompatible with chlorates, permanganates, and other oxidizers.

CHLORALAMIDE.

Chloralformamide. Colorless bitter crystals. Soluble in about 21 parts of water, 2 of alcohol. Hypnotic, sedative; analgesic. **Uses:** insomnia of alcoholism, cardiac affections, pulmonary affections, neuralgia, and hysteria. **Dose:** 1 Gm. (gr. xv); maximum dose, 4 Gm. (dr. i), single; 8 Gm. (dr. ii) daily.

CHLORAL HYDRATE.

Soluble in about 1 part of water. Hypnotic; antispasmodic; analgesic; antiseptic. **Uses:** *internally*, insomnia, puerperal eclampsia, mania, delirium tremens, convulsions, chorea, tetanus. **Dose:** 1 Gm. (gr. xv), in sweetened solution, well diluted; in nervous dyspepsia, 0.12–0.3 Gm. (gr. ii–v) after meals; maximum dose, 5 Gm. (dr. 1½) per day. Contraindicated in gastritis; large doses must not be given in heart disease; in children and the aged, use with caution.

CHLORETONE. P.

Acetone-chloroform. White crystals of camphoraceous odor and taste. Soluble in 100 parts of water, 7 of glycerin. Local anæsthetic, hypnotic, antiseptic. **Uses:** painful wounds, burns, etc.; insomnia in the aged, etc. **Dose:** 0.3–1 Gm. (gr. v–xv); *externally*, in saturated aqueous solution, 10 per cent. ointment, or dusting powder.

CHLOROFORM.

Soluble in all proportions of alcohol or ether, in about 200 parts of water. Antiseptic; anæsthetic; analgesic. **Uses:** *internally*, in colic, asthma, cramps, cough, hiccough, tic douloureux, etc.; by *inhalation*, as an

anæsthetic in surgery; *externally*, as a liniment for rheumatism, colic, neuralgia, etc. Dose: 0.3 c.c. (℥ v), preferably as the spirit; maximum dose, 1.3 c.c. (gr. xx). Preparations: water, 16 c.c. (fldr. iv); spirit, 2 c.c. (℥ xxx); emulsion, 8 c.c. (fldr. ii); liniment.

CHRYSAROBIN.

So-called chrysophanic acid; purified goa powder. Yellow powder. Soluble in boiling alcohol. Antiparasitic; alterative. Uses: Psoriasis, herpes tonsurans, pityriasis versicolor, hemorrhoids. Dose: 0.03 Gm. (gr. $\frac{1}{4}$). Preparation; ointment (6 per cent.).

CIMICIFUGA.

Black snakeroot; black cohosh. Sedative; alterative; analgesic; emmenagogue. Uses: chorea, heart disease (where digitalis is contraindicated), rheumatism, myalgia, hysteria, dysmenorrhœa, amenorrhœa. Dose: 1 Gm. (gr. xv). Preparations: extract, 0.25 Gm. (gr. iv); fluidextract, 1 c.c. (℥ xv); tincture (20 per cent.), 4 c.c. (fldr. i).

CINCHONA.

Antiperiodic, bitter tonic. Uses: malaria, anorexia, debility, etc. Dose: 1 Gm. (gr. xv). Preparations: fluidextract, 1 c.c. (℥ xv); tincture (20 per cent.), 4 c.c. (fldr. i).

CINCHONIDINE.

White crystals. Soluble in dilute acids, insoluble in water. Antiperiodic, and bitter tonic like quinine. Uses: malaria, anorexia. Dose: 0.25 Gm. (gr. iv) in pills or syrup.

COCA.

Erythroxyton. Nerve stimulant; muscle tonic; invigorant. Uses: hysteria, melancholia, debility, dyspepsia, muscular exhaustion, and various diseases of the nervous system. Dose: 2 Gm. (gr. xxx). Preparation: fluidextract, 2 c.c. (℥ xxx); wine, 16 c.c. (fldr. iv.)

COCAINE HYDROCHLORATE.

Soluble in about $\frac{1}{2}$ part of water, $3\frac{1}{2}$ parts of alcohol. Local and general anæsthetic; stimulant; antipruritic; mydriatic. **Uses:** local anæsthetic on all mucous membranes, toothache, catarrh, whooping-cough, tonsillitis, vomiting, ringing in the ears, etc. **Dose:** 0.03 Gm. (gr. $\frac{1}{2}$); best given in powder; maximum dose, 0.12 Gm. (gr. ii), single; 0.36 Gm. (gr. vi), daily.

CODEINE.

Methylmorphine. Soluble in about 120 parts of water. Hypnotic; analgesic; sedative. **Uses:** instead of morphine but not in severe pain; particularly in bronchitis, irritating coughs, diabetes mellitus, diseases of the respiratory organs, and in cure of morphine habit. **Dose:** 0.03 Gm. (gr. $\frac{1}{2}$); maximum dose, 0.1 Gm. (gr. $1\frac{1}{2}$), single; 0.3 Gm. (gr. v), daily.

COLCHICINE.

Yellow crystals or amorphous powder; very bitter taste. Soluble in water or alcohol. **Uses:** rheumatism, gout, asthma, cerebral congestion. **Dose:** 0.0005 Gm. (gr. $\frac{1}{100}$), 2 or 3 times daily; maximum dose, 0.002 Gm. (gr. $\frac{1}{50}$), single; 0.005 Gm. (gr. $\frac{1}{20}$), daily.

COLCHICUM ROOT.

Alterative; sedative; diuretic; expectorant. **Uses:** rheumatism, gout, dropsy, asthma, and ascites from hepatic obstruction. **Dose:** 0.25 Gm. (gr. iv).

COLCHICUM SEED.

Action, uses, and dose like those of the root. **Preparations:** fluidextract. 0.2 c.c. (℥ iii); tincture (10 per cent.), 2 c.c. (℥ xxx); wine, 2 c.c. (℥ xxx).

COLCHI-SAL. P.

Antirheumatic; antipodagric. **Dose:** 2-4 capsules with meals and at bedtime.

COLLARGOL.

Argentum Credé; colloidal silver. Soluble metallic silver. Antiseptic. *Uses:* sepsis, lymphangitis, cellulitis, etc. *Dose:* 0.01-0.02 Gm. (gr. $\frac{1}{4}$ - $\frac{1}{2}$) 2 or 3 times daily; *externally*, mostly in 15 per cent. ointment ("Unguentum Credé"), 12 Gm. (dr. iii) of this by inunction; also in 1:1000-1:5000 lotion.

COLLODION, CANTHARIDAL.

Blistering or vesicating collodion. Olive-green, syrupy liquid. Represents 60 per cent. cantharides. *Uses:* as blister instead of cantharides.

COLLODION, STYPTIC.

20 per cent. tannic acid. *Uses:* bleeding wounds.

COLOCYNTH.

Drastic cathartic; diuretic. *Uses:* obstinate constipation and dropsical conditions. *Dose:* 0.065 Gm. (gr. i). Preparations: extract, 0.03 Gm. (gr. $\frac{1}{2}$); compound extract, 0.5 Gm. (gr. viii); compound cathartic pill, 2 pills; vegetable cathartic pill, 2 pills.

CONIUM.

Hemlock. Antispasmodic; sedative; anodyne. *Uses:* *internally*, maniacal excitement, whooping-cough, chorea; *externally*, neuralgia, rectal diseases, pruritus. *Dose:* 0.2 Gm. (gr. iii). Preparation: fluidextract, 0.2 c.c. (m iii).

CONVALLARIA.

Lily of the valley. Heart tonic; diuretic. *Uses:* functional and organic affections of the heart, and cardiac dropsy. *Dose:* 0.5 Gm. (gr. viii). Preparation: fluidextract, 0.5 c.c. (gr. viii).

COPAIBA.

Balsam, copaiba or copaiva. Soluble in ether. Stimulant; expectorant; diuretic; laxative. *Uses:* *externally*,

locally in indolent ulcers and chilblains; *internally*, gonorrhœa, cystitis, leucorrhœa, etc. Dose: 1 c.c. (℥ xv). Preparation: oil, 0.5 c.c. (℥ viii).

COPPER SULPHATE.

Soluble in about 3 parts of water, insoluble in alcohol. Escharotic; styptic; astringent; emetic, alterative; nervine. Uses: *internally*, chronic diarrhœa, hemorrhage, croup, etc.; *externally*, ulcers, gonorrhœa, hyperidrosis, warts, fungous granulations, edges of callous wounds, bleeding surfaces, etc. Dose: as astringent 0.01 Gm. (gr. $\frac{1}{4}$); as emetic, 0.25 Gm. (gr. iv).

CORROSIVE SUBLIMATE.—See Mercury Bichloride.

COTTON-ROOT BARK.

Emmenagogue; oxytocic. Uses: amenorrhœa, menorrhagia, and instead of ergot. Dose: 2 Gm. (gr. xxx).

CREOLIN, PEARSON. P.

Saponified coal-tar creosote, Pearson. Dark syrupy liquid; tar odor. Soluble in alcohol, in water to 2½ per cent. yielding a milky emulsion. Disinfectant; deodorizer. Uses: substitute for carbolic acid, etc., in general disinfection—apartments, hospitals, school-rooms, etc. Removes odor of iodoform. *Externally* in ½–2 per cent. solution. CAUTION: aqueous solution should be freshly made when wanted.

CREOSOTAL.—See Creosote Carbonate.

CREOSOTE.

Soluble in about 150 parts of water, miscible in all proportions with alcohol. Antitubercular; antiseptic; antipyretic; anthelmintic. Uses: phthisis, toothache, vomiting, diarrhœa, cholera morbus, dysentery, etc. Diluted applied locally in chilblains, burns, diphtheria, fetid leucorrhœa. Dose: 0.2 c.c. (℥ iii). Preparation: water, 8 c.c. (dr. ii).

CREOSOTE CARBONATE. P.

Creosotal. Colorless to yellowish, odorless, slightly bitter liquid. Soluble in alcohol, insoluble in ether. Antitubercular. **USES:** like creosote. **DOSE:** 1.3 c.c. (℥ xx), gradually increased to 5.5 c.c. (dr. i $\frac{1}{2}$) 3 times a day.

CUBEBS.

Carminative; sedative; diuretic. **USES:** gonorrhœa, leucorrhœa; bronchial, pharyngeal, and nasal catarrhs; urethritis; prostatitis. **DOSE:** 1 Gm. (gr. xv). Preparations: fluidextract, 1 c.c. (℥ xv); oleoresin, 0.5 Gm. (gr. viii); troches; oil, 0.5 c.c. (℥ viii).

DERMATOL. P.—See Bismuth Subgallate.

DIGITALIN. (Merck's Amorphous.)

White yellowish powder. Soluble in water. Reliable heart tonic; diuretic; adapted for injection. **USES:** cardiac diseases, dropsy, pulmonary œdema. **DOSE:** 0.006–0.03 Gm. (gr. $\frac{1}{16}$ – $\frac{1}{4}$) 3 or 4 times daily, in pills, tablets, or subcutaneously.

DIGITALIS.

USES as in digitalin. **DOSE:** 0.065 Gm. (gr. i). Preparations: extract, 0.01 Gm. (gr. $\frac{1}{8}$); fluidextract, 0.05 c.c. (℥ i); tincture, 1 c.c. (℥ xv); infusion, 8 c.c. (dr. ii).

DIOXYGEN. P.—See Perhydrol.

DIURETIN. P.

White odorless powder, decomposing on exposure. Soluble in water. Diuretic. **USES:** dropsy, Bright's disease, especially that following scarlet fever. **DOSE:** 1 Gm. (gr. xv), 5 or 6 times daily in powder or capsule followed by water; maximum dose, 6 Gm. (dr. 1 $\frac{3}{4}$) daily.

DOVER'S POWDER.—See under Opium, Powdered.

DUOTAL. P.—See Guaiacol Carbonate.

ELATERIN.

Crystal powder with very bitter taste. Soluble in about 300 parts of alcohol, insoluble in water. Drastic purgative. **Uses:** ascites, uræmia, pulmonary oedema, poisoning by narcotics, etc. **Dose:** 0.005 Gm. (gr. $\frac{1}{4}$); maximum dose, 0.01 Gm. (gr. $\frac{1}{2}$), daily, in trituration with a trace of saccharin. **Preparation:** trituration (10 per cent.) 0.03 Gm. (gr. $\frac{1}{2}$).

ERGOT.

Emmenagogue; oxytocic; hæmostatic. **Uses:** to promote labor; menorrhagia, metrorrhagia, and other internal hemorrhages; night-sweats, migraine, epilepsy, chronic cerebral congestion, enuresis, etc. **Dose:** 2 Gm. (gr. xxx). **Preparations:** extract (syn. ergotin), 0.5 Gm. (gr. viii); fluidextract, 2 c.c. (℥ xxx); wine, 8 c.c. (fldr. ii).

ERGOTIN.

Alcohol-purified aqueous extract of ergot. Soluble in water. **ACTION AND USES;** like ergot. **Dose:** 0.2–0.6 Gm. (gr. iii–x).

ERIODICTYON.

Yerba santa. Expectorant; alterative; antitarrhal. **Uses:** coughs, colds, inflammation of the genito-urinary organs, etc., and to disguise the taste of quinine and other disagreeable remedies. **Dose:** 1 Gm. (gr. xv). **Preparation:** fluidextract, 1 c.c. (℥ xv).

ERYTHROL TETRANITRATE.

Crystalline mass exploding on percussion; therefore, on the market only in tablets with chocolate, each containing gr. $\frac{1}{2}$ of the medicament. Vasodilator and antispasmodic, like nitroglycerin. **Uses:** angina pectoris, asthma, cardiac diseases, chronic inflammation of the kidneys, etc.; reported especially useful as

a prophylactic in preventing anginal pain. Dose: 1-2 tablets every 4 hours.

ETHER.

Sulphuric ether. Inhalation anæsthetic; analgesic; antispasmodic. Uses: *internally*, by inhalation as anæsthetic in surgical operations; gastrodynia, colic, tetanus, nervous affections, dyspnoea, etc.; *externally*, earache, toothache, neuralgia, local pains. Dose: 1 c.c. (℥ xv). Preparations: spirit, 4 c.c. (fldr. i); compound spirit, 4 c.c. (fldr. i); oil, used in the preparation of compound spirit.

ETHYL CHLORIDE.

Gas at ordinary temperatures and pressures; when compressed, colorless liquid. Soluble in alcohol. Local anæsthetic. Uses: minor and dental surgery, and neuralgia, as spray; heat of hand forcing spray from the tubes. Hold 6-10 inches away from the part. CAUTION: highly inflammable.

EUCAINE, BETA. P.

White powder. Soluble in about 30 parts of water, 14 of alcohol. Local anæsthetic, specially intended for ophthalmic use; also in dentistry. Applied in 2-3 per cent. solution in ophthalmic and dental work; in 5-10 per cent. solution for nose and throat; also in Schleich's infiltration anæsthesia; in 5-10 per cent. ointment with 2 per. cent. menthol in hemorrhoids.

EUCALYPTOL.

Cineol. Soluble in ether, insoluble in water. Antiseptic; expectorant; antispasmodic; antiperiodic. Uses: *inhalation* in diphtheria, asthma; *internally*, colds, bronchitis, pneumonia; *externally*, rhinitis, scarlet fever, measles, and chicken-pox. Dose: 0.3 c.c. (℥ v), 4 or 5 times daily, in capsules or sweetened emulsion or on sugar. Injection: 0.5-1 c.c. (℥ 8-15) of mixture of 2-5 eucalyptol and 10 liquid paraffin.

EUCALYPTUS.

Antiperiodic; antiseptic; tonic; hæmostatic. **Uses:** hemorrhage, asthma, dyspepsia, malaria. **Dose:** 2 Gm. (gr. xxx). **Preparation:** fluidextract, 2 c.c. (℥ xxx).

EUQUININE. P.

Quinine carbonic ether. Zimmer. Tasteless, light, fleecy conglomerations of white needles. Slightly soluble in water. Antimalarial; febrifuge; tonic. **Uses:** malaria, febrile infectious diseases, whooping-cough, neuralgia, prophylactic, for malaria, and especially in idiosyncrasy against quinine. **Dose:** 0.25 Gm. (gr. iv) in powder or tablet, or with soup, milk, or cocoa.

EUTHYMOL. P.

Antiseptic; germicide. Each fluidounce is stated to contain: oil of eucalyptus, $\frac{3}{4}$ ℥; oil of gaultheria, $\frac{3}{4}$ ℥; fluidextract of wild indigo, 1 $\frac{1}{2}$ ℥; boric acid, 10 $\frac{1}{2}$ gr.; thymol, $\frac{1}{2}$ gr.

EXTRACT, BONE MARROW. P.

Hæmatinic; nutrient. **Dose:** 4-8 c.c. (fldr. 1-2), in water, milk, or wine, three times daily.

EXTRACT, MALE FERN.

Oleoresin male fern; oleoresin aspidium. Thick brown liquid; bitter unpleasant taste. Efficacious and safe anthelmintic. **Dose:** 4 Gm. (dr. i), taken in three portions at intervals of $\frac{1}{2}$ hour, in capsules, followed if necessary in 1-2 hours by calomel and jalap. **CAUTION:** shake well before dispensing. Oleoresin, 2 Gm. (gr. xxx).

EXTRACT, OPIUM, AQUEOUS.

Dose: 0.03 Gm (gr. $\frac{1}{2}$); maximum dose, 0.12 Gm. (gr. ii), single; 0.3 Gm. (gr. v), daily.

EXTRACT, THYROID.—See Thyroidin.

FORMALDEHYDE.

Aqueous solution of formaldehyde gas; about 30 per cent. Colorless, volatile liquid with a pungent odor. Non-corrosive surgical and general antiseptic (in wounds, abscesses, etc., for clothing, bed-linen, walls, etc.); antihydrotic; preservative of anatomical and botanical specimens. Applied in vapor or solution: in surgery, $\frac{1}{4}$ – $\frac{1}{2}$ per cent. solution; general antiseptics $\frac{1}{4}$ –2 per cent. solution or in vapor; phthisis, whooping-cough, etc., 2 per cent. spray or inhalation; excessive perspiration, 1–2 per cent. solution; for hardening anatomical specimens, 4–10 per cent. solution.

FORMALIN OR FORMOL.—See Formaldehyde.

FORMIN. P.

Hexamethylenetetramine. Minute crystals. Soluble in water, slightly soluble in alcohol. Uric acid solvent; diuretic; and urinary antiseptic. Uses: gout, cystitis, etc. Dose: 0.3–1 Gm. (gr. v–xv) 2 or 3 times daily, as tablets taken in the morning or morning and evening, in lithia water or carbonated water.

FRANGULA.

Buckthorn. Laxative; cathartic. Uses: chronic constipation. Preparation: fluidextract, 1–2 c.c (15–30 m).

GALL, OX, PURIFIED.

Laxative; digestive. Uses: dropsy, chronic constipation. Dose: 0.125 Gm. (gr. ii).

GELSEMININE.

White, microscopic crystals. Soluble in alcohol (salts are soluble in water). Antineuralgic; antispasmodic. Uses: neuralgia, rheumatism, dysmenorrhœa, etc.; also antidote to strychnia. Dose: 0.0005–0.002 Gm. ($\frac{1}{120}$ – $\frac{1}{30}$ gr.); maximum dose, 0.002 Gm. (gr. $\frac{1}{30}$), single; 0.012 Gm. (gr. $\frac{1}{8}$), daily.

GELSEMIUM.

Yellow jasmine. Antineuralgic; nerve sedative; antispasmodic. **Uses:** neuralgia, coryza, dysuria, hysteria, dysmenorrhœa, whooping-cough, asthma, etc. **Dose:** 0.065 Gm. (gr. i). **Preparations:** fluid-extract, 0.05 Gm. (℥ i); tincture (10 per cent.), 0.5 c.c. (℥ viii).

GENTIAN.

Bitter tonic; alterative. **Uses:** anorexia, dyspepsia, amenorrhœa, atonic gout, etc. **Dose:** 1 Gm. (gr. xv). **Preparations:** extract, 0.25 Gm. (gr. iv); fluid-extract, 1 c.c. (℥ xv); tincture (10 per cent.) 4 c.c. (fldr. i).

GINGER.

Aromatic carminative. **Uses:** dyspepsia, flatulence, diarrhœa, colic. **Dose:** 1 Gm. (gr. xv). **Preparations:** oleoresin, 0.03 Gm. (gr. $\frac{1}{2}$); fluidextract, 1 c.c. (℥ xv); tincture (20 per cent.), 2 c.c. (℥ xxx); syrup, 16 c.c. (fldr. iv).

GLYCO-THYMOLINE. P.

Antiseptic. **Dose:** 4 c.c. (fldr. i), diluted: *externally* in about 20 per cent. solution.

GLYCOZONE. P.

Disinfectant; antizymotic. **Dose:** 4-8 c.c. (fldr. i-ii); *enema*; 15-30 c.c. (floz. $\frac{1}{2}$ -1) in 1-2 pints of water.

GLYCYRRHIZA.

Liquorice root. Demulcent; expectorant; corrigent. **Uses:** chiefly to cover unpleasant taste of bitter preparations. **Dose:** 2 Gm. (gr. xxx). **Preparations:** extract, 1 Gm. (gr. xv); pure extract, 1 Gm. (gr. xv); fluidextract, 2 c.c. (℥ xxx); elixir adjuvans, ad lib.; compound powder, 4 Gm. (dr. i); compound mixture, 8 c.c. (fldr. ii); troches, of licorice and opium.

GOLD CHLORIDE.

Auric chloride. Brown very deliquescent crystal masses. Soluble in water and alcohol. Antitubercular. **Uses:** scrofula and tuberculosis. **Dose:** 0.0012-0.004 Gm. (gr. $\frac{1}{80}$ - $\frac{1}{20}$).

GOLD AND SODIUM CHLORIDE.

Soluble freely in water. Alterative; nervine. **Uses:** syphilis, whooping-cough, cancer, hysteria, neuralgia, rheumatism, dipsomania, etc. **Dose:** 0.005 Gm. (gr. $\frac{1}{40}$).

GRINDELIA.

Antispasmodic; sedative; anticatarrhal. **Uses:** asthma, hay fever, whooping-cough, catarrh of the bladder, etc. **Dose:** 2 Gm. (gr. xxx). **Preparation:** fluidextract, 2 c.c. (℥ xxx).

GUAIAIC.

Resin guaiac. Soluble in alcohol, insoluble in water. Diaphoretic; alterative; stimulant; laxative. **Uses:** scrofula, syphilis, chronic rheumatism, gout, amenorrhœa, scarlet fever. **Dose:** 1 Gm. (gr. xv). **Preparations:** tincture (20 per cent.), 4 c.c. (fldr. i); ammoniated tincture (20 per cent.), 2 c.c. (℥ xxx).

GUAIACOL.

Faintly yellowish, limpid, oily liquid; characteristic aromatic odor. Soluble in alcohol and about 100 parts of water. Antitubercular; antiseptic; antipyretic; local anodyne. **Uses:** *internally*, phthisis, lupus, and intestinal tuberculosis, etc.; *externally*, epididymitis, surgical tuberculosis, pleurisy, etc. **Dose:** 0.5 Gm. (gr. viii).

GUAIACOL CARBONATE.

Duotal. Small, white, odorless crystals. Slightly soluble in alcohol, insoluble in water. Antitubercular. **Dose:** 1 Gm. (gr. xv).

GUARANA.

Antineuralgic; astringent; stimulant; tonic; anodyne.
 Uses: sick-headache, diarrhoea, etc. Dose: 2 Gm.
 (gr. xxx). Preparation: fluidextract, 2 c.c. (m xxx).

HAMAMELIS.

Witchhazel. Antiseptic; astringent; styptic. Uses:
 hemorrhoids, gonorrhoea, leucorrhoea, varicose veins,
 etc. Dose: 2 Gm. (gr. xxx). Preparation: water,
 8 c.c. (fldr. ii).

HEDEOMA.

Pennyroyal. Aromatic; stimulant; emmenagogue.
 Uses: amenorrhoea, flatulent colic. Dose: 8 c.c.
 (fldr. ii). Preparation: oil, 0.2 Gm. (gr. iii).

HELMITOL. P.

Hexamethylenetetramine-anhydromethylene citrate.
 Colorless crystals. Soluble in water, insoluble in
 alcohol. Urinary antiseptic. Uses: cystitis, ure-
 thritis, pyelitis, etc. Dose: 1 Gm. (gr. xv) 3-4 times
 a day.

HEMATOXYLON.

Logwood. Astringent. Uses: chronic diarrhoea,
 dysentery, and relaxed condition of the intestines.
 Preparation: extract, 1 Gm. (gr. xv).

HEROIN.

Diacetyl morphine. White bitter powder. Insoluble
 in water. Cough sedative; antispasmodic. Uses:
 phthisis, bronchitis, asthma, etc. Dose: 0.005-0.01
 Gm. (gr. $\frac{1}{12}$ - $\frac{1}{8}$).

HEROIN HYDROCHLORATE.

White bitter powder. Soluble in water and alcohol.
 Uses and dose: same as heroin.

HEXAMETHYLENETETRAMINE.—See Formin.

HOLOCAINE HYDROCHLORATE. P.

White crystalline powder. Soluble in about 50 parts of water, 6 of alcohol. Local anæsthetic like cocaine. **Uses:** chiefly in eye diseases, in 1 per cent. solution, prepared in porcelain (not in glass).

HOMATROPINE HYDROBROMATE.

Small white crystals. Soluble in about 10 parts of water, 133 of alcohol. Mydriatic; antihydrotic; sedative. **Uses:** chiefly as mydriatic; night-sweats, psychoses, etc. **Dose:** 0.0005 Gm. (gr. $\frac{1}{110}$); *externally* to eye, in 1 per cent. solution.

HYDRASTINE HYDROCHLORATE.

White powder. Freely soluble in water or alcohol. Astringent; dermic; hæmostatic. **Uses:** *internally*, uterine hemorrhage, dyspepsia, hemorrhoids, etc.; *externally*, gonorrhœa, conjunctivitis, endometritis, leucorrhœa, cervical erosions, seborrhœa, etc. **Dose:** 0.01 Gm. (gr. $\frac{1}{10}$) every 2 hours if necessary; *externally*, conjunctivitis, $\frac{1}{10}$ – $\frac{1}{5}$ per cent. solution; in skin diseases, 1 per cent ointment or lotion; maximum dose; 0.1 Gm. (gr. $\frac{1}{10}$), single; 0.3 Gm. (gr. v), daily.

HYDRASTIS.

Golden seal. Hæmostatic; cholagogue; antihydrotic; astringent. **Uses:** uterine hemorrhage, jaundice, leucorrhœa, piles, gonorrhœa, spinal irritation, night-sweats, and internal hemorrhage. **Dose:** 2 Gm. (gr. xxx). Preparations: fluidextract, 2 c.c. (℥ xxx); glycerite, 2 c.c. (℥ xxx); tincture (20 per cent.), 4 c.c. (fldr. ii).

HYDROGEN PEROXIDE.—See Solution Hydrogen Peroxide.

HYDROZONE. P.

Antiseptic. **Dose:** 4 c.c. (fldr. i), well diluted; *externally* in 2–3 per cent. solution.

HYOSCINE HYDROBROMATE.

Colorless crystals. Hypnotic; sedative; mydriatic.

Uses: to quiet and give sleep to insane and others.

Dose: 0.0005 Gm. (gr. $\frac{1}{16}$).

HYOSCYAMUS.

Henbane. Antispasmodic; hypnotic; sedative; analgesic. Uses: *internally*, spasmodic cough, irritated bladder, insomnia, hysteria, delirium tremens; *externally*, hemorrhoids. Dose: 0.25 Gm. (gr. iv). Preparations; extract, 0.065 Gm. (gr. i); fluidextract, 0.2 c.c. (℥ iv); tincture (10 per cent.), 1 c.c. (℥ xv).

ICHTHYOL.

Ammonium sulpho-ichthyolate. Thick brown liquid from bituminous shale found in Tyrol; bituminous odor; contains easily assimilable sulphur. Soluble in water. Antiphlogistic; antiseptic; alterative. Uses: *internally*, phthisis, skin diseases, gout, scrofula, nephritis, etc.; *externally*, 5-50 per cent. ointments, lotions, etc., in erysipelas, burns, carbuncles, chilblains, rheumatism, peritonitis, etc.; 10 per cent. with glycerin, on tampons or in suppository, in uterine or vaginal inflammation; 1-3 per cent. solution or 0.06-0.12 c.c. (℥ i-ii) bougies in gonorrhœa; pure in ivy poisoning. Dose: 0.2-2 c.c. (℥ iii-xxx), in pills or capsules, or in water.

INGLUVIN. P.

Digestive ferment obtained from gizzard of chicken. Yellowish powder. Uses: vomiting of pregnancy, dyspepsia, etc. Dose: 0.3-1.3 Gm. (gr. v-xx).

IODINE.

Almost insoluble in water. Antiseptic; alterative; caustic. Uses: *externally*, by inhalation in croup and bronchitis, and in ointment in skin diseases; *internally*, in scrofula, struma, syphilis, etc. Dose: 0.005 Gm. (gr. $\frac{1}{40}$). Preparations: compound liquor, 0.2 c.c. (℥ iii); tincture (7 per cent.), 0.1 c.c. (℥ ii); ointment.

IODOFORM.

Almost insoluble in water. Antiseptic; alterative; anæsthetic; antitubercular. *Uses:* *internally*, usually in combination with tannin, in pulmonary and intestinal hemorrhage, and in scrofula and diseases of the liver; *externally*, as surgical antiseptic for wounds, sores, etc. *Dose:* 0.25 Gm. (gr. iv). *Preparation:* ointment (10 per cent.); in tuberculosis and diseases of the joints, injections of a 10 per cent. oily emulsion are practised.

IPECAC.

Emetic; diaphoretic; expectorant. *Uses:* as emetic in poisoning, croup, etc.; bronchitis, coughs, pulmonary hemorrhage, hiccough, etc. *Dose:* expectorant, 0.065 Gm. (gr. i); emetic, 1 Gm. (gr. xv). *Preparations:* fluidextract, expectorant, 0.05 c.c. (℥ i), emetic, 1 c.c. (℥ xv); wine, 1 c.c. (℥ xv); syrup, expectorant, 1 c.c.; emetic, 15 c.c. (fldr. iv); powder of ipecac and opium, 0.5 Gm. (gr. viii); tincture of ipecac and opium (10 per cent.), 0.5 c.c. (℥ viii).

IRON BY HYDROGEN.

Reduced iron; Quevenne's iron. Chalybeate. *Uses:* anæmia, chlorosis, hysteria, neuralgia, scrofula, debility, etc. *Dose:* 0.065 Gm. (gr. i), in pill or tablets.

IRON CARBONATE.

Vallets mass. 20 per cent. FeCO_3 . Hæmatinic. *Uses:* anæmia, etc. *Dose:* 0.2–0.3 Gm. (gr. iii–v), in pill.

IRON SULPHATE.

Soluble in about 2 parts of water, insoluble in alcohol. Tonic; astringent; chalybeate. *Uses:* *internally*, anæmia and chlorosis, especially with tendency to hemorrhage, night-sweats; *externally*, leucorrhœa, eczema, etc. *Dose:* 0.2 Gm. (gr. iii). *Preparations:* dried sulphate, 0.125 Gm. (gr. ii); granulated sulphate, 0.2 Gm. (gr. iii).

IRON AND AMMONIUM CITRATE.

Reddish brown, transparent, hygroscopic scales. Soluble freely in water, insoluble in alcohol. Chalybeate like other iron compounds. Dose: 0.25 Gm. (gr. iv). Preparation: wine of iron, 8 c.c. (fldr. ii).

IRON AND POTASSIUM TARTRATE.

Freely soluble in water, insoluble in alcohol. Tonic; chalybeate; emmenagogue. Uses: non-astringent, agreeable chalybeate. Dose: 0.25 Gm. (gr. iv).

IRON AND QUININE CITRATE.

Freely soluble in water, partially in alcohol. Tonic; emmenagogue; astringent; antipyretic. Uses: where quinine and iron are indicated. Dose: 0.25 Gm. (gr. iv).

JALAP.

Diuretic; hydrogogue; cathartic; anthelmintic. Uses: dropsy, cerebral hyperæmia, constipation, worms, etc. Dose: 1 Gm. (gr. xv). Preparations: resin, 0.125 Gm. (gr. ii); compound powder, 2 Gm. (gr. xxx).

KINO.

Astringent; styptic. Uses: diarrhoea, pyrosis, leucorrhoea, passive hemorrhages, diabetes, etc. Dose: 0.5 Gm. (gr. viii). Preparation: tincture (5 per cent.), 4 c.c. (fldr. i).

LACTOPEPTINE. P.

Digestive. Dose: 0.6–1.3 Gm. (gr. x–xx).

LACTOSE.—See Milk Sugar.

LACTUCARIUM.

Partly soluble in alcohol and water. Anodyne; hypnotic; sedative. Uses: nervousness, cough. Dose: 1 Gm. (gr. xv). Preparations: tincture, 2 c.c. (m xxx); syrup, 8 c.c. (fldr. ii).

LANOLIN. P.—See Lanum.

LANUM.

Adeps lanæ hydrosus; hydrous wool fat. A superior wool fat especially prepared for medical and pharmaceutical uses. Yellowish-white unctuous mass; freely takes up water and aqueous solutions. Neutral, non-irritating, permanent emollient, and base for ointments and creams; absorbed very rapidly from the skin.

LEAD ACETATE.

Soluble in about 3 parts of water, 25 of alcohol. Astringent; styptic; antihydrotic. **USES:** *internally*, diarrhoea, dysentery, gastric and intestinal hemorrhage, phthisical night-sweats, etc.; *externally*, astringent eye lotion and injection or wash (1:100-1:500) in gonorrhœa. **DOSE:** 0.065 Gm. (gr. i).

LIME, SULPHURATED.

(So-called calcium sulphide.) Slightly soluble in water, insoluble in alcohol. Alterative; depilatory. **USES:** chiefly in boils, carbuncle, acne, scrofula, phthisis. **DOSE:** 0.015-0.12 Gm. (gr. $\frac{1}{4}$ -2).

LIME WATER.—See Solution Calcium Hydrate.

LIQUOR.—See Solution.

LISTERINE. P.

Antiseptic. **DOSE:** 4 c.c. (fldr. i), diluted. **USES:** *externally* in solution up to 20 per cent.

LITHIUM CITRATE.

Colorless crystals. Soluble in about 5 parts of water, insoluble in alcohol. **USES:** like other lithium salts but more agreeable and less irritating to the stomach. **DOSE:** 0.5 Gm. (gr. viii). Preparation: effervescent citrate, 8 Gm. (dr. ii).

LITHIUM SALICYLATE.

White powder. Freely soluble in water and alcohol. Antiarthritic; antirheumatic. **USES:** gout and artic-

LIST OF COMMONLY USED DRUGS. 151

ular rheumatism instead of sodium salicylate. **DOSE:** 1 Gm. (gr. xv).

LOBELIA.

Antispasmodic; expectorant. **USES:** spasmodic asthma, whooping-cough, croup, pneumonia, and colds. **DOSE:** 0.5 Gm. (gr. viii). Preparations: fluidextract, 0.5 c.c. (m viii); tincture (10 per cent.), expectorant, 1 c.c. (m xv), emetic, 4 c.c. (fldr. i).

LUNAR CAUSTIC.—See Silver Nitrate.

LYSOL. P.

Brown, oily liquid. Soluble in water and alcohol. Antiseptic; disinfectant. Application: $\frac{1}{2}$ –2 per cent. solution.

MAGNESIUM CARBONATE.

Insoluble in water or alcohol. Antacid; laxative; antilithic. **USES:** constipation, sour stomach, heart-burn, stone in bladder. **DOSE:** 3 Gm. (dr. 1 $\frac{1}{2}$). Preparation: solution, 360 c.c. (oz. xii).

MAGNESIUM OXIDE.

Light or calcined magnesia. Light white powder; slightly alkaline taste. Soluble in carbonic acid water. Antacid; laxative; antilithic. **USES:** *internally*, sick-headache, gout, dyspepsia, sour stomach, constipation; *externally*, ulcers and abraded surfaces, in tooth powders, etc. **DOSE:** 2 Gm. (gr. xxx).

MAGNESIUM SULPHATE.

Epsom salt. Soluble in 1 $\frac{1}{2}$ parts of water, insoluble in alcohol. Cathartic; refrigerant. **USES:** constipation, lead colic, fevers, inflammatory affections. **DOSE:** 16 Gm. (dr. iv). Preparation: effervescent magnesium sulphate, 16 Gm. (dr. iv).

MENTHOL.

Soluble in less than its weight of alcohol, insoluble in water. Analgesic; anæsthetic; antiseptic; stimulant.

USES: *internally*, nervous diarrhoea, vomiting; *externally*, toothache, headache, neuralgia, insects' bites, pruritus, inhalation in hay fever, asthma, and chronic bronchitis. DOSE: 0.065 Gm. (gr. i); maximum dose, 6 Gm. (dr. 1½), daily. For toothache, put a crystal into cavity. Tampons, 1 in 5 of oil.

MERCURY.

Preparations: mercury with chalk, 0.25 Gm. (gr. iv); mass of mercury, 0.25 Gm. (gr. iv); ointment (50 per cent.); dilute ointment; plaster.

MERCURY, AMMONIATED.—See Mercury Ammonium Chloride.

MERCURY BICHLORIDE.

Corrosive sublimate. Soluble in 20 parts of water, 5 of alcohol. Tonic; antiseptic; caustic; alterative; germicide. USES: *internally*, syphilis, chronic rheumatism, and skin diseases; *externally*, in collodion as caustic; nævi, etc.; in alcohol, in ringworm; in leprosy, ulcers, various skin diseases, antiseptic dressings, surgical operations, diphtheria, disinfection, etc. DOSE: 0.003 Gm. (gr. ⅓); maximum dose, 0.02 Gm. (gr. ⅓), single; 0.065 Gm. (gr. i), daily.

MERCURY CHLORIDE, MILD.

Calomel. Insoluble in water or alcohol. Cathartic; alterative; diuretic; antiseptic; anthelmintic; USES: *internally*, constipation, cholera, dysentery, cardiac dropsy, pleurisy, malaria, syphilis, worms, infectious diseases, gout, etc.; *externally*, smallpox pitting, pruritus, warts, etc. DOSE: laxative, 0.125 Gm. (gr. ii); alterative, 0.065 Gm. (gr. i). Preparation: compound cathartic pill.

MERCURY CYANIDE.

Colorless crystals. Soluble in about 15 parts of water, 20 of alcohol. Alterative; antiseptic; tonic; antisypilitic. USES: instead of corrosive sublimate; much less

irritating. Recommended in diphtheria, membranous croup, and syphilis. Dose: 0.005-0.01 Gm. (gr. $\frac{1}{12}$ - $\frac{1}{8}$) in solution; *externally* (gargle), 1-10,000 solution; *hypodermatically*, 0.005-0.01 Gm. (gr. $\frac{1}{12}$ - $\frac{1}{8}$).

MERCURY IODIDE, RED.

Mercury biniodide. Almost insoluble in water, soluble in 300 parts of olive oil. Alterative; germicide; antiseptic; antisyphilitic; emmenagogue. Uses: *internally* and *externally*, in syphilis, scrofula, lupus. Dose: 0.003 Gm. (gr. $\frac{1}{30}$). Preparation: solution of arsenic and mercury iodide, 0.1 c.c. (℥ ii).

MERCURY IODIDE, YELLOW.

Mercury proto-iodide; green mercurous iodide. Insoluble in water and alcohol. Antisyphilitic; emmenagogue; alterative. Uses: advanced syphilis, scrofula, etc. Dose: 0.01 Gm. (gr. $\frac{1}{10}$).

MERCURY SALICYLATE.

White powder; about 50 per cent. mercury. Insoluble in water and alcohol. Antisyphilitic; antigonorrhœic, alterative. Uses: *externally*, chancre, gonorrhœa, and venereal affections; 1 per cent. powder or ointment; injection in urethra, 1:10,000-5:10,000 solution. Dose: 0.02-0.06 Gm. (gr. $\frac{1}{2}$ -1).

MERCURY SUCCINAMIDE.

Mercury imido-succinate. White powder. Soluble in about 25 parts of water with the aid of heat, slightly soluble in alcohol. Antisyphilitic; alterative; antiseptic. Dose: 0.012-0.02 Gm. (gr. $\frac{1}{8}$ - $\frac{1}{4}$) daily hypodermatically.

MESOTAN. P.

Methyloxymethylester of salicylic acid. Yellow liquid. Soluble in alcohol. Local antirheumatic. Uses: gout, rheumatism, etc. Application: 4 c.c. (℥dr. i) of a mixture of equal parts of mesotan and olive oil.

METHYL SALICYLATE.

Synthetic oil of wintergreen (oil of gaultheria). Freely soluble in alcohol. **Uses:** inflammatory articular rheumatism. **Dose:** 1 c.c. (gr. xv), gradually increased. Also applied locally in chronic articular rheumatism.

METHYLENE BLUE.

Tetramethylthionine hydrochlorate. Bluish crystals or blue powder. Soluble in about 50 parts of water. Anodyne; antiperiodic; antipyretic. **Uses:** gonorrhœa, rheumatism. **Dose:** 0.25 Gm. (gr. iv); injection; 0.06 Gm. (gr. i); maximum dose, 1 Gm. (gr. xv), single or daily.

METHYLMORPHINE.—See Codeine.**MILK OF MAGNESIA. P.**

Liquid magnesia, each 30 c.c. (floz. i) representing 1.5 Gm. (gr. xxiv) magnesium hydrate in permanent suspension. Antacid. **Dose:** 4–15 c.c. (fldr. i–iv).

MILK SUGAR.

Lactose. Soluble in about six parts of water, insoluble in alcohol. Nutritive; diuretic. **Uses:** consumption, cardiac dropsy, and wasting diseases; also in infant nutrition. **Dose:** 30–180 Gm. (oz. i–vi) per day.

MORPHINE SULPHATE.

Soluble in about 21 parts of water. **Uses:** to relieve pain, nervous excitement, etc. **Dose:** 0.015 Gm. (gr. $\frac{1}{4}$). Preparation: compound powder, 0.5 Gm. (gr. viii).

MUSK.

Stimulant and antispasmodic. **Uses:** nervous affections, typhus and typhoid fever, convulsions, etc. **Dose:** 0.25 Gm. (gr. iv). Preparation: tincture (5 per cent.).

MYRRH.

Astringent; carminative; cathartic; emmenagogue. **Uses:** *internally*, dyspepsia, general debility, chronic

LIST OF COMMONLY USED DRUGS. 155

catarrh, amenorrhœa, chlorosis, and pectoral troubles; *externally*, unhealthy sores, sore gums, and sore mouth. Dose: 0.5 Gm. (gr. viii). Preparations: tincture (20 per cent.), 1 c.c. (℥ xv); tincture of aloes and myrrh (10 per cent.), 2 c.c. (℥ xxx); pill of aloes and myrrh, 2 pills.

NAPHTHALIN.

Soluble in about 20 parts of alcohol, insoluble in water or glycerin. Antiseptic; antidiarrhœal; anthelmintic. Uses: *internally*, intestinal catarrh, worms, cholera, typhoid fever, chronic bronchitis, chorea, etc.; *externally*, skin diseases. Dose: 0.125 Gm. (gr. ii).

NAPHTHOL, BETA.

Soluble in about 1 part of alcohol, insoluble in water. Antiseptic; parasiticide. Uses: *internally*, typhoid, chronic diarrhœa; *externally*, psoriasis, eczema, scabies, and other skin diseases, in 2-10 per cent. ointment. Dose: 0.2-0.5 Gm. (gr. iii-viii); maximum dose, 1 Gm. (gr. xv), single; 4 Gm. (dr. i), daily.

NUTGALL.

Galls. Astringent. Uses: *internally*, chronic dysentery, diarrhœa, poisoning by strychnine and other alkaloids; *externally*, prolapsus ani, hemorrhoids, and as gargle in ulcerated fauces and relaxed uvula. Dose: 0.5 Gm. (gr. viii). Preparations: tincture, 20 per cent., 4 c.c. (dr. i); ointment.

NUTMEG.

Aromatic; carminative. Dose: 0.5 Gm. (gr. viii). Preparation: oil, 0.2 c.c. (℥ iii).

NUX VOMICA.

Stomachic; tonic; respiratory stimulant. Uses: chronic constipation, dyspepsia, nervous diseases, neuralgia, and as antidote to poisoning by opium, chloral, and other narcotics. Dose: 0.065 Gm. (gr. i). Preparations: ex-

tract, 0.015 Gm. (gr. $\frac{1}{4}$); fluidextract, 0.05 c.c. (℥ i);
tincture (10 per cent.) 0.6 c.c. (℥ iv).

OIL, ALMOND, BITTER.

Soluble in all proportions of alcohol, in about 300 parts of water. Nerve sedative. Uses: *internally*, coughs; *externally*, to allay severe itching and in neuralgia. Dose: 0.03 c.c. (℥ $\frac{1}{2}$).

OIL, BETULA.

Oil sweet birch. Uses, dose, etc., as of oil of gaultheria.

OIL, CADE.

Juniper tar. Uses: in psoriasis, favus, gout, rheumatism, chronic skin eruptions, etc.

OIL, CAJUPUT.

Stimulant; diaphoretic. Uses: *internally*, bronchitis, catarrh, toothache, colic, flatulence, asthma, and tapeworms; *externally*, psoriasis, acne, pityriasis, and neuralgias. Dose: 0.5 c.c. (℥ viii).

OIL, CASTOR.

Cathartic. Uses: constipation, colic, diarrhoea, and dysentery. Dose: 16 c.c. (fldr. iv).

OIL, COD-LIVER.

Alterative; nutrient. Uses: tuberculosis, scrofula, rheumatism, etc. Dose: 16 c.c. (fldr. iv).

OIL, CROTON.

Purgative; rubefacient. Uses: *internally*, obstinate constipation, dropsy; *externally*, rheumatism, neuralgia, and indolent swellings; *hypodermatically* to nævi. Dose: 0.05 c.c. (℥ i).

OIL, EUCALYPTUS.

Antiseptic; antipyretic; disinfectant. Uses: *internally*, remittent fever, bronchitis, and by inhalation in

asthma and catarrh; *externally*, skin diseases (in 1:5 oily solution). Dose: 0.5 c.c. (℥ viii).

OIL, GAULTHERIA.

Oil wintergreen. Analgesic; antirheumatic; antiseptic. Uses: rheumatic affections, pleurisy pericarditis; *externally*, orchitis, epididymitis, articular rheumatism, etc. Dose: 1 c.c. (℥ xv). Preparation: spirit, flavoring.

OIL, JUNIPER BERRIES.

Diuretic; carminative; stimulant. Uses: *internally*, dropsy and suppression of urine. In surgery, for preserving surgical ligatures. Dose: 0.2 c.c. (℥ iii). Preparations: spirit, 2 c.c. (℥ xxx); compound spirit, 8 c.c. (℥ dr. ii).

OIL, MUSTARD.

Rubefacient; stimulant. Uses: instead of mustard plaster in pleuritic neuralgia or rheumatic pains. Dose: 0.008 c.c. (gr. $\frac{1}{4}$). Preparation: compound liniment.

OIL, OLIVE.

Emollient; nutritive; laxative. Uses: *internally*, constipation, worms, poisoning, gall-stones, etc.; *externally*, blistered or injured surfaces, etc. Dose: 30 c.c. (℥ dr. viii).

OIL, PINUS.

Oil mountain pine. Fragrant oil; terbinthinous taste. Soluble in alcohol. Antiseptic; expectorant. Uses: inhalation in pectoral affections; *internally*, as stimulating expectorant; *externally*, lately employed in glandular enlargements, boils, and skin diseases. Dose: 0.3–0.6 c.c. (℥ v–x).

OIL, SANTAL.

Oil sandalwood. Internal antiseptic; anticatarrhal. Uses: gonorrhoea, gleet, bronchitis, and inflammation of mucous membranes generally. Dose: 0.5 c.c. (℥ viii).

OIL, TAR.

Antiseptic. *Uses:* *internally*, bronchial affections; chiefly used *externally* in skin diseases. *Dose:* 0.2 c.c. (℥ iii).

OIL, TURPENTINE.

Anthelmintic; antiseptic; diuretic; rubefacient. *Uses:* rheumatism, sciatica, lumbago, gonorrhœa, hæmoptysis, worms, ammenorrhœa, and as antidote in phosphorus poisoning. For *internal* use only the rectified oil answers. *Dose:* 1 c.c. (℥ xv).

OIL, WINTERGREEN, ARTIFICIAL.—See Methyl Salicylate.

OIL, WINTERGREEN, TRUE.—See Oil, Gaultheria.

OINTMENT, MERCURIC NITRITE.

Citrine ointment. Stimulant and alterative dermic. Applied in 10–50 per cent. dilution with a fatty vehicle.

OLEATE, MERCURY. (25 per cent.)

Alterative; antiparasitic; antisyphilitic. *Uses:* *externally*, skin diseases, pediculi, also for endermic administration of mercury.

OLEORESIN, CAPSICUM.

Soluble in alcohol and ether. Rubefacient; stimulant. *Uses:* *internally*, flatulence, and to arouse appetite; *externally*, diluted with soap liniment or olive oil, in lumbago, neuralgia, and rheumatic affections. *Dose:* 0.03 Gm. (gr. $\frac{1}{4}$).

OLEORESIN, MALE FERN.—See Extract, Male Fern.

OPIUM.

Not less than 9 per cent. morphine. For action, uses, etc., see opium, powdered.

OPIUM, POWDERED.

Morphine, 12–12 $\frac{1}{2}$ per cent. Stimulant; narcotic; antispasmodic; hypnotic; anodyne. *Uses:* insomnia,

neuralgia, colic, dyspepsia, rheumatism, diabetes, pleurisy, peritonitis, tetanus, delirium tremens, cholera, dysentery, etc.; ease pain, give rest and sleep, check morbid secretions, relieve cough, and allay irritability. Dose: 0.1 Gm. (gr. ii). Modifications: powdered opium, granulated opium, and deodorized opium, dose of all, 0.065 Gm. (gr. i). Preparations: extract, 0.03 Gm. (gr. $\frac{1}{4}$); tincture (10 per cent.), 0.5 c.c. (℥ viii); deodorized tincture (10 per cent.), 0.5 c.c. (℥ viii); wine, 0.5 c.c. (℥ viii); vinegar, 0.5 c.c. (℥ viii); tincture of ipecac and opium, 0.5 c.c. (℥ viii); powder of ipecac and opium, 0.5 Gm. (gr. viii); camphorated tincture, 8 c.c. (fldr. ii); pill, 1 pill; troches of licorice and opium (0.005 Gm. in each); plaster.

ORPHOL.—See Bismuth Betanaphtholate.

ORTHOFORM. P.

White odorless powder. Slightly soluble in water, soluble in alcohol. Local and internal anodyne, antiseptic. Uses: chiefly *externally* on painful burns, wounds, toothache, etc. Applied pure or in 10–20 per cent. mixtures with starch talcum, etc., or in 10–20 per cent. ointment. Dose: 0.5–1 Gm. (gr. viii–xv).

PANCREATIN.

Amylolytic; proteolytic; emulsifiant. Uses: aid to duodenal digestion. Dose: 0.3–1 Gm. (gr. v–xv).

PAPAIN. P.

Papayotin. Concentrated active principle of juice of *Carica Papaya* (pawpaw). Enzyme similar to pepsin but acting in alkaline, acid, or neutral solution. Whitish, slightly hygroscopic powder. Soluble in water, insoluble in alcohol. Digestive. Uses: for dissolving false membrane and for aiding digestion. Dose: 0.12–0.3 Gm. (gr. ii–v), with sodium bicarbonate; *externally* in 5 per cent. solution equal parts of glycerin and water, for diphtheria and croup.

PARALDEHYDE.

Colorless fluid; crystal below 10.5° C.; aromatic, suffocating odor; warm taste. Soluble in alcohol and about 10 parts of water. Hypnotic; antispasmodic; stimulant. Uses: insomnia, asthma, phthisis, chorea, alcoholism, delirium tremens, insanity, mental exhaustion, etc. Dose: 2-6 c.c.; (fldr. $\frac{1}{2}$ -1 $\frac{1}{2}$), well diluted in elixir, sweet water, brandy, or rum; maximum dose, 10 c.c. (fldr. 2 $\frac{1}{2}$).

PELLETIERINE TANNATE.

Grayish-brown, hygroscopic, tasteless powder. Soluble in about 80 parts of alcohol, 700 of water. Anthelmintic; teniafuge. Dose: 0.25 Gm. (gr. iv) in 30 c.c. (flox. i) of water, followed in 2 hours by a cathartic.

PEPPERMINT.

Carminative, diffusible stimulant; nervine. Uses: flatulence, colic, dysentery, nausea, and nervous affections; *externally* (usually as oil of peppermint), in headache, toothache, neuralgia, rheumatism, catarrh, hay fever, asthma, etc.

PEPSIN.

Soluble in about 100 parts of water (with turbidity); insoluble in alcohol. Proteolytic. Uses: *internally*, dyspepsia, peptonizing milk for invalids, digesting false membranes; *externally*, digesting gangrenous tissue from unhealthy wounds. Dose: 0.25 Gm. (gr. iv).

PEPSIN, SACCHARATED.

Dose: 4-10 Gm. (dr. 1-1 $\frac{1}{4}$).

PEPTENZYME. P.

Digestant. Dose: 0.2-0.6 Gm. (gr. iii-ix).

PEPTO-MANGAN (GUDE). P.

Hæmatinic. Dose: 4-15 c.c. (fldr. i-iv).

PERHYDROL. P.

Hydrogen peroxide, 30 per cent. by weight (or 100 per cent. by volume), H_2O_2 . Miscible in all proportions with water or alcohol. Disinfectant; deodorant; styptic; antizymotic. **Use:** chiefly *externally*, in diphtheria, sore throat, wounds, gonorrhœa, abscesses, etc.; *internally*, in flatulence, gastric affections, phthisical sweats, etc.; *hypodermatically* (0.2 per cent. solution), in cyanide poisoning. **Dose:** 4 c.c. (fldr. i).

PHENACETIN. P.

Para-acetphenetidin. White tasteless powder. Soluble in about 1700 parts of water, 20 of alcohol. Antipyretic; antineuralgic; analgesic. **Uses:** *internally*, neuralgia, rheumatism, whooping-cough, chorea, influenza, tonsillitis, scarlatina. **Dose:** 0.5 Gm. (gr. viii).

PHENALGIN. P.

Analgesic; febrifuge. **Dose:** 0.6–1.3 Gm. (gr. x–xx).

PHENAZONE.—See Antipyrin.

PHENOL.—See Carbolic Acid.

PHENYLACETAMIDE.—See Acetanilid.

PHENYL SALICYLATE.—See Salol.

PHOSPHORUS.

Soluble in oils. Stimulant to the nervous system. **Uses:** melancholia, sexual exhaustion, neuralgia, rachitis, caries, osteomalacia, etc. **Dose:** 0.0005 Gm. (gr. $\frac{1}{160}$). Preparation: pill, containing 0.0006 Gm. (gr. $\frac{1}{160}$).

PHYSOSTIGMA.

Calabar bean. **ACTION AND USES:** like physostigmine. **Dose:** 0.1 Gm. (gr. ii). Preparations: extract, 0.008 Gm. (gr. $\frac{1}{125}$); tincture (10 per cent.), 1 c.c. (m xv).

PHYSOSTIGMINE SALICYLATE.

Eserine salicylate. Slightly yellowish crystals. Soluble in about 150 parts of water, 15 of alcohol. Antitetanitic; spinal depressant; peristaltic; stimulant; laxative; analgesic; myotic. *Uses:* strychnine poisoning, tetanus, tonic convulsions, constipation, muscular rheumatism, phantom tumors, chronic bronchitis, etc.; in solution to contract pupil. *Dose:* 0.001 Gm. (gr. $\frac{1}{80}$); maximum dose, 0.002 Gm. (gr. $\frac{1}{40}$), single; 0.003 Gm. (gr. $\frac{1}{30}$) daily. Application, in 0.2-0.5 per cent. solution as eye-drops in ophthalmia neonatorum, to overcome midriasis of atropine, breaking posterior adhesions, in prolapse of the iris, cataract, glaucoma, and corneal ulcers.

PHYTOLACCA ROOT.

Poke root. Alterative; emetic; purgative; antifat. *Uses:* *internally*, tonsillitis, chorea, scrofula; *externally*, ointment, ulcers, psoriasis, tenia capitis, eczema, and to arrest flow of milk. *Dose:* 0.125 Gm. (gr. ii). Preparation: fluidextract, 1 c.c. (℥ xv).

PICROTOXIN.

Cocculin. Soluble in about 300 parts of water, 10 of alcohol. Antihydrotic; nervine; antispasmodic. *Uses:* night-sweats of phthisis; also paralysis, epilepsy, chorea, flatulent dyspepsia, dysmenorrhœa; also antidote to chloral. *Dose:* 0.0006-0.002 Gm. (gr. $\frac{1}{160}$ - $\frac{1}{80}$); Maximum dose, 0.006 Gm. (gr. $\frac{1}{10}$).

PILOCARPINE HYDROCHLORATE.

Freely soluble in water or alcohol. Sialagogue; galactagogue; myotic; diaphoretic; diuretic. *Uses:* *internally*, dropsy, coryza, laryngitis, bronchitis, asthmatic dyspnoea, uræmic convulsions, croup, atropine poisoning, etc.; *externally*, 1-2 per cent. aqueous solution for collyrium. Contraindicated in heart failure and during fasting. *Dose:* 0.01 Gm. (gr. $\frac{1}{100}$); maximum dose, 0.02 Gm. (gr. $\frac{1}{50}$), single; 0.04 Gm. (gr. $\frac{1}{25}$), daily.

PILOCARPUS.

Jaborandi. ACTION AND USES: like pilocarpine hydrochlorate. DOSE: 2 Gm. (gr. xxx). Preparation: fluidextract, 2 c.c. (℥ xxx).

PIPERAZINE. P.

Diethylenediamine. Colorless alkaline crystals. Freely soluble in water. Antipodagric; antirheumatic. DOSE: 0.3-0.6 Gm. (gr. v-x) 3 times a day well diluted.

PODOPHYLLIN.—See Resin, Podophyllum.

PODOPHYLLUM.

May apple. Cathartic; cholagogue, tonic, alterative. USES: hepatic congestion, constipation, rheumatism, scrofula, and bilious fevers. DOSE: 0.5 Gm. (gr. viii). Preparations: resin, purgative, 0.015 Gm. (gr. $\frac{1}{4}$), laxative, 0.005 Gm. (gr. $\frac{1}{15}$); fluidextract, 0.5 Gm. (gr. viii); pill, 1 pill.

POMEGRANATE.

Anthelmintic; astringent.; antiperiodic. USES: tape-worms, diarrhoea, night-sweats, and intermittent fever. DOSE: 2 Gm. (gr. xxx). Preparation: fluidextract, 2 c.c. (℥ ii).

POTASSA.—See Potassium Hydrate.

POTASSA, SULPHURATED.

Soluble readily and almost completely in water, partially soluble in alcohol. Alterative; antacid; emetic; local irritant. USES: internally, rheumatism, gout, scrofula, painter's colic, skin disease, catarrh, croup, lead and mercury poisoning; externally, lotion in parasitic skin diseases. DOSE: 0.12-0.6 Gm. (gr. ii-x).

POTASSIUM ACETATE.

Very deliquescent. Soluble in less than 1 part of water, 2 of alcohol. Diuretic; aperient; cathartic. USES:

gout, lithiasis, rheumatism, dropsy, eczema, and psoriasis. Dose: 2 Gm. (gr. xxx).

POTASSIUM BICARBONATE.

Soluble in about 4 parts of water, almost insoluble in alcohol. Diuretic, antilithic; antacid. Uses: dyspepsia, dropsy, lithiasis, sour stomach, jaundice, etc. Usually taken effervescent with tartaric or citric acid. Dose: 2 Gm. (gr. xxx).

POTASSIUM BICHROMATE.

Soluble in about 100 parts of water. Caustic; astringent; alterative. Uses: *internally*, aphonia, gastric ulcer, syphilis; *externally*, sweating feet, tubercular nodes, syphilitic vegetations and warts. Dose: 0.005-0.015 Gm. (gr. $\frac{1}{15}$ - $\frac{1}{4}$); *externally*, in 5 per cent. solution for sweating feet; 10 per cent. solution as caustic.

POTASSIUM BITARTRATE.

Cream of tartar. Soluble in about 200 parts of water, insoluble in alcohol. Cathartic; diuretic; aperient. Uses: dropsy and as refrigerant drink in febrile affections. Dose: diuretic, 2 Gm. (gr. xxx); cathartic, 15 Gm. (dr. iv).

POTASSIUM BROMIDE.

Soluble in about 2 parts of water. Antiepileptic; sedative; hypnotic. Uses: epilepsy, neurasthenia, convulsions, delirium tremens, tetanus, syphilis, scrofula, semi-impotence, nyphomania, urethral fever, and poisoning by iodoform and strychnia. Dose: 1 Gm. (gr. xv).

POTASSIUM CARBONATE.

Soluble in 2 parts of water, insoluble in alcohol. Antacid; solvent. Uses: *internally*, acid stomach, lithiasis, dropsy, jaundice; *externally*, as 16 per cent. ointment or bath in cutaneous affections. Dose: 1 Gm. (gr. xv).

POTASSIUM CHLORATE.

Soluble in 17 parts of water, insoluble in alcohol. Antiseptic. *USES: internally*, all forms of stomatitis, diphtheria, mercurial poisoning, and diseases of mucous membranes; also as mouth washes and gargles in 3-5 per cent. solution. *DOSE: 0.25 Gm. (gr. iv).*

POTASSIUM CITRATE.

Soluble in about 1 part of water, slightly in alcohol. Diaphoretic; refrigerant. *USES: lithiasis, fevers, and bronchial affection.* *DOSE: 1 Gm. (gr. xv).* Preparations: effervescent citrate, 4 Gm. (dr. i); solution, 16 c.c. (fldr. iv).

POTASSIUM CYANIDE.

Soluble in about 2 parts of water, slightly in alcohol. Sedative; analgesic; anodyne. *USES: internally*, dyspnoea, phthisis, asthma, whooping-cough, etc. *DOSE: 0.01 Gm. (gr. $\frac{1}{10}$).*

POTASSIUM GLYCERINOPHOSPHATE.

Thick liquid or a mass. Soluble in water. Nerve tonic. *USES: neurasthenia, phosphaturia, convalescence from influenza, deficient nerve nutrition, Addison's disease, etc.* *DOSE: 0.25-0.6 c.c. (m iv-x) 3 or 4 times daily in mixture.* Injection, 0.2-0.25 c.c. (m iii-iv) once daily in water containing sodium chloride.

POTASSIUM HYDRATE.

Caustic potassa; potassium hydroxide. Freely soluble in water and alcohol. Escharotic; antacid; diuretic. *USES: internally*, lithiasis, gonorrhoea, acid dyspepsia, and cutaneous affection; *externally*, destroying warts, gangrenous tissue, etc. *DOSE: 0.015-0.06 Gm. (gr. $\frac{1}{4}$ -i).* Preparation: solution, 1 c.c. (m xv).

POTASSIUM HYPOPHOSPHITE.

Soluble in about 1 part of water. Nerve stimulant. *USES: phthisis, scrofula, and all cases of deficient nerve power.* *DOSE: 0.5 Gm. (gr. viii).*

POTASSIUM IODIDE.

Soluble in about 1 part of water. Alterative; uric acid solvent; antisymphilitic. **USES:** *internally*, phthisis, rheumatism, pericarditis, syphilis, aneurisms, scrofulous swellings, lead poisoning, angina pectoris, asthma. **DOSE:** 0.5 Gm. (gr. viii). **Preparation:** ointment (10 per cent.).

POTASSIUM NITRATE.

Saltpetre; nitre. Soluble in about 4 parts of water, slightly soluble in alcohol. Antiseptic; refrigerant; diuretic; diaphoretic. **USES:** fevers, dropsy, asthma, rheumatism, diseases of gastric and intestinal mucosa. Fumes of burning potassium nitrate paper also used in asthma. **DOSE:** 0.5 Gm. (gr. viii).

POTASSIUM PERMANGANATE.

Soluble in about 18 parts of water, decomposed by alcohol. Disinfectant; deodorant, emmenagogue. **USES:** morphine poisoning, diphtheria; also as 1:16 wash in diphtheria and scarlatina, and in carcinoma, foul ulcers, fetid breath, and perspiring feet. **DOSE:** 0.065 Gm. (gr. i), in solution or pills made with kaolin and petrolatum, or with cacao butter, after meals.

POTASSIUM AND SODIUM TARTRATE.

Rochelle salt. Soluble in about 1½ parts of water, insoluble in alcohol. Purgative, refrigerant. **USES:** constipation, headache, dropsy, rheumatism; preferred laxative in hemorrhoids. **DOSE:** 8 Gm. (dr. ii).

PROTARGOL. P.

Proteid compound of silver; 8 per cent. silver. Yellow powder. Soluble in water. **USES:** chiefly gonorrhœa, and ophthalmia neonatorum. Applied in ½-2 per cent. solution.

PUMPKIN SEED.

Anthelmintic. **DOSE:** 30 Gm. (dr. viii).

PYROGALLOL.—See Acid, Pyrogallic.

QUASSIA.

Bitter tonic; anthelmintic; antipyretic; antiparasitic. **USES:** to stimulate digestive organs and create appetite; chronic constipation; worms, fever, etc. **DOSE:** 0.5 Gm. (gr. viii). **Preparations:** extract, 0.065 Gm. (gr. i); fluidextract, 0.5 c.c. (℥ viii); tincture (20 per cent.), 2 c.c. (℥ xxx).

QUININE.

Soluble in about 6 parts of alcohol, 2000 parts of water. Antipyretic; antiperiodic; ebolic; tonic. **USES:** febrifuge in typhus and typhoid fever, remittent and intermittent fevers, malaria, amenorrhœa; to hasten labor, and as a general bitter tonic. The salts are usually prescribed. For hypodermatic use the bisulphate, dihydrochlorate, or carbamidated hydrochlorate is to be preferred. **DOSE:** 0.25 Gm. (gr. iv). Injection, the salts mentioned below.

QUININE BISULPHATE.

Soluble in about 10 parts of water, 32 of alcohol; eligible for subcutaneous use. Nasal injection (in hay fever): 0.2 per cent. aqueous solution. **DOSE:** as of quinine.

QUININE SULPHATE.

Soluble in about 740 parts of water, 65 of alcohol. **DOSE:** as of quinine.

QUININE TANNATE.

Light brown insoluble powder. Used chiefly for children. **DOSE:** (for children) 0.3–1 Gm. (gr. v–xv) with chocolate in powder or tablets.

QUININE AND UREA HYDROCHLORATE.

Carbamidated quinine dihydrochlorate. Colorless crystals. Soluble freely in water or alcohol. Used by injection: 0.12–0.5 Gm. (gr. ii–viii).

RESIN, JALAP.

Heavy jalap resin. Soluble in alcohol. Hydragogue cathartic. **USES:** chronic constipation, dropsy, etc.; usually with other remedies. **DOSE:** 0.125 Gm. (gr. ii).

RESIN, PODOPHYLLUM.—See Podophyllum.**RESIN, SCAMMONY.**

Hydragogue cathartic. **USES:** with other cathartics to increase their energy. **DOSE:** 0.2 Gm. (gr. iii).

RESINOL. P.

Unguentum resinol. Antipruritic; antiphlogistic. *Externally*, pure, night and morning.

RESORCIN.

Resorcinol. White crystals; reddish on exposure; unpleasant sweet taste. Soluble in about 1 part of alcohol, and 1 part of water. Antiseptic; antipyretic; anti-emetic. **USES:** *internally*, in vomiting, sea-sickness, dyspepsia, cholera infantum, diarrhoea, and diphtheria. **DOSE:** 0.125 Gm. (gr. ii).

RHUBARB.

Cathartic; astringent; tonic; stomachic. **USES:** diarrhoea, constipation, hepatic diseases and to promote appetite. **DOSE:** 1 Gm. (gr. xv). Preparations: extract, 0.25 Gm. (gr. iv); fluidextract, 1 c.c. (℥ xv); tincture (20 per cent.), 4 c.c. (fldr. i); syrup, 8 c.c. (fldr. ii); aromatic tincture (20 per cent.), 2 c.c. (℥ xxx); aromatic syrup, 8 c.c. (fldr. ii); mixture of rhubarb and soda, 4 c.c. (fldr. i); compound powder, 2 Gm. (gr. xxx); compound rhubarb pill, 2 pills.

ROCHELLE SALT.—See Potassium and Sodium Tartrate.**RUBUS.**

Blackberry. Astringent; tonic. **USES:** diarrhoea, dysentery, etc. **DOSE:** 1 Gm. (gr. xv). Preparations: fluidextract, 1 c.c. (℥ xv); syrup, 4 c.c. (fldr. i).

SACCHARIN.

Garantose; gluside. White powder fully 550 times as sweet as cane-sugar. Soluble in about 30 parts of alcohol, 400 of water. **USES:** to sweeten the food of diabetics and dyspeptics; to cover taste of bitter and acrid medicines.

SALICIN.

Soluble in about 30 parts of water, 60 of alcohol. Tonic, antiperiodic; antirheumatic. **USES:** rheumatism, malaria, puerperal fever, chorea, etc. **DOSE:** 1 Gm. (gr. xv).

SALOL.

Phenyl salicylate. Almost insoluble in water. Antiseptic; antipyretic; antirheumatic, etc. **USES:** *internally*, typhoid fever, diarrhoea, dysentery, fermentative dyspepsia, rheumatism, grip and cystitis; coating for enteric pills, such pills being taken one hour or more after meals and no oil with them. **DOSE:** 0.5 Gm. (gr. viii).

SALOPHEN. P.

Acetylparamidophenol salicylate. White, odorless, tasteless leaflets or powder; 51 per cent. salicylic acid. Soluble in alcohol, insoluble in water. Antirheumatic; antiseptic; antipyretic; analgesic. **USES:** rheumatism, gout, chorea; *externally*, in psoriasis and other itching skin diseases, as 1:10 ointment. **DOSE:** 0.3-1 Gm. (gr. v-xv); maximum dose, 1.3 Gm. (gr. xx), single; 6 Gm. (dr. 1½) daily.

SALT, EPSOM.—See Magnesium Sulphate.

SALT, GLAUBER'S.—See Sodium Sulphate.

SALT, ROCHELLE.—See Potassium and Sodium Tartrate.

SALTPETRE.—See Potassium Nitrate.

SANGUINARIA.

Bloodroot. Expectorant; emetic. **USES:** chiefly in cough mixtures as expectorant. **DOSE:** 0.125 Gm. (gr. ii). Preparations: fluidextract, 0.1 c.c. (℥ ii); tincture (10 per cent.), 1 c.c. (℥ xv).

SANTONIN.

Anhydrous santoninic acid. Soluble in about 40 parts of alcohol, insoluble in water. Anthelmintic; tonic. **USES:** worms. **DOSE:** 0.065 Gm. (gr. i). Preparation: troches, containing 0.03 Gm. (gr. $\frac{1}{2}$).

SARSAPARILLA.

Alterative; tonic. **USES:** in syphilis, scrofula, rheumatism, and skin diseases. Usually with mercury and potassium iodide. **DOSE:** 2 Gm. (gr. xxx). Preparations: fluidextract, 2 c.c. (℥ xxx); compound fluidextract, 2 c.c. (℥ xxx); compound syrup, 16 c.c. (fldr. iv).

SCAMMONY.

Hydragogue cathartic. **USES:** with other cathartics to increase their power. **DOSE:** 0.25 Gm. (gr. iv). Preparations: resin, 0.2 Gm. (gr. iii).

SCOPARIUS.

Broom. Diuretic; purgative. **USES:** dropsy. **DOSE:** 1 Gm. (gr. xv).

SCOPOLAMINE HYDROBROMATE.

From *Scopolia atropoides*. Colorless hygroscopic crystals. Soluble in about 4 parts of water, 15 of alcohol. Mydriatic; sedative. **USES:** *externally*, in ophthalmology, $\frac{1}{16}$ – $\frac{1}{8}$ per cent. solution. **DOSE:** 0.0005 Gm. (gr. $\frac{1}{200}$); maximum dose, 0.001 Gm. (gr. $\frac{1}{100}$), single; 0.003 Gm. (gr. $\frac{1}{30}$), daily.

SENEGA.

Expectorant; diuretic; alterative; sedative. **USES:** coughs, colds, catarrhal affections, croup, dropsy,

LIST OF COMMONLY USED DRUGS. 171

rheumatism, asthma, etc. Dose: 1 Gm. (gr. xv). Preparations: fluidextract, 1 c.c. (℥ xx); Syrup, 4 c.c. (f℥dr. i).

SENNA.

Cathartic. Uses: constipation and febrile diseases. Dose: 4 Gm. (dr. i). Preparations: fluidextract, 2 c.c. (℥ xxx); syrup, 4 c.c. (f℥dr. i); compound infusion, 120 c.c. (f℥oz. iv); compound licorice powder, 4 Gm. (dr. i).

SILVER NITRATE.

Soluble in about 1 part of water, 26 of alcohol. Antiseptic; alterative; stimulant; escharotic; irritant. Uses: *internally*, chronic diarrhoea, subacute gastritis, gastric ulcer, intestinal affections; *externally*, in 2 per cent. solution in gonorrhoea; caustic for ulcers, warts, etc.: ophthalmic practice; odontalgia; external hemorrhoids, etc. Dose: 0.01 Gm. (gr. $\frac{1}{4}$). Preparations: fused nitrate in form of pencils; mitigated silver nitrate.

SILVER NITRATE (Molded).—See Silver Nitrate.

SILVER NITRATE (Diluted).—See Silver Nitrate.

SODIUM ACETATE.

Soluble in about 2 parts of water, 30 of alcohol. Uses: cystitis, dropsy, and diseases of the urinary organs. Dose: 1.0 Gm. (gr. xv).

SODIUM ARSENATE.

Soluble in about 4 parts of water, slightly soluble in alcohol. Alterative; tonic; antiseptic; antiperiodic. Uses: *internally*, malaria, debility, anæmia, chorea, nervous diseases; also in cigarettes for asthma and phthisis; *externally*, in baths for rheumatism and gout. Dose: 0.005 Gm. (gr. $\frac{1}{40}$). Preparations: dried drug, 0.003 Gm. (gr. $\frac{1}{80}$); solution 0.2 c.c. (℥ iii).

SODIUM BENZOATE.

Soluble in about 2 parts of water, 45 of alcohol. Antirheumatic; antipyretic; antiseptic. **USES:** rheumatism, gout, uræmia, cystitis, lithæmia, tonsillitis, colds, etc. **DOSE:** 1 Gm. (gr. xv).

SODIUM BICARBONATE.

Soluble in about 12 parts of water, insoluble in alcohol. Antacid; antiseptic. **USES:** acid stomach, lithiasis, cystitis, etc. **DOSE:** 1 Gm. (gr. xv). **Preparation:** troches.

SODIUM BORATE.

Borax; so-called sodium baborate or tetraborate. Soluble in about 25 parts of water, insoluble in alcohol. Antiseptic; emmenagogue. **USES:** *internally*, amenorrhœa, dysmenorrhœa; *externally*, sore mouth, conjunctivitis, urethritis, skin diseases, aphthæ, etc. **DOSE:** 0.5 Gm. (gr. viii).

SODIUM BROMIDE.

Soluble in about 2 parts of water, 16 of alcohol. Sedative; mild hypnotic. **USES:** epilepsy, headache, hysteria, nymphomania, satyriasis, delirium tremens, insomnia, scrofula, nervousness. Less depressing than potassium bromide. **DOSE:** 1 Gm. (gr. xv).

SODIUM CACODYLATE.

Sodium dimethylarsenate. White powder. Soluble in water. Alterative; hæmatinic like arsenous acid. **USES:** chiefly obstinate psoriasis, pseudoleukæmia, diabetes, anæmia, chlorosis, chorea, Basedow's disease, tuberculosis. **DOSE:** 0.06-0.12 Gm. (gr. i-ii).

SODIUM CITRATE.

White powder. Freely soluble in water, slightly soluble in alcohol. Diuretic; antilithic; refrigerant. **USES:** gout, cystitis, rheumatism, fevers, etc. **DOSE:** 1 Gm. (gr. xv).

SODIUM GLYCERINOPHOSPHATE.

Thick liquid or mass. Soluble in water. Reconstructive. **Uses:** Deficient nerve nutrition, neurasthenia, phosphaturia, convalescence from influenza, exophthalmic goitre, Addison's disease, lumbago, etc. **Dose:** 0.25-0.6 Gm. (gr. iv-x), 3 or 4 times daily.

SODIUM HYDRATE.

Sodium hydroxide; caustic soda. Freely soluble in water or alcohol. Caustic; antacid. **Dose:** 0.03-0.6 Gm. (gr. $\frac{1}{3}$ -1) freely diluted. **Preparation:** solution, 1 c.c. (m xv).

SODIUM HYPOPHOSPHITE.

Soluble in about 1 part of water, 30 of alcohol. Tonic; alterative. **Uses:** Phthisis, scrofula, defects in bony structure, and wasting diseases. **Dose:** 1 Gm. (gr. xv). **Preparations:** syrup, 8 c.c. (fldr. ii); compound syrup, 8 c.c. (fldr. ii).

SODIUM NITRITE.

White crystals or sticks; mildly saline taste. Soluble in about 2 parts of water; slightly soluble in alcohol. Antispasmodic, diaphoretic, diuretic. **Uses:** angina pectoris, dropsy, and diseases of the genito-urinary organs. **Dose:** 0.065 Gm. (gr. i).

SODIUM PHOSPHATE.

Colorless crystals. Soluble in about 6 parts of water, insoluble in alcohol. Cathartic; antilithic. **Uses:** mild laxative and in vesical calculi. **Dose:** 2 Gm. (gr. xxx). **Preparations:** dried sodium phosphate, 1 Gm. (gr. xv); effervescent, 8 Gm. (dr. ii); compound solution, 8 c.c. (fldr. ii).

SODIUM SALICYLATE.

Soluble in about 1 part of water, 6 of alcohol. Antirheumatic, antiseptic; antipyretic. **Uses:** rheumatism, neuralgia, pleurisy, chorea, pericarditis, migraine, etc. **Dose:** 1 Gm. (gr. xv); maximum dose, 4 Gm. (dr. i).

SODIUM SULPHATE.

Glauber's salt. Soluble in about 3 parts of water, insoluble in alcohol. Cathartic; aperient; diuretic.

Uses: constipation, dropsy, torpid liver, cystitis.

Dose: 16 Gm. (dr. iv).

SODIUM THIOSULPHATE.

Sodium hyposulphite. Soluble in about 1 part of water, insoluble in alcohol. Antiseptic; germicide.

Uses: parasitic skin disease, sore mouth, diarrhoea, flatulent dyspepsia, etc. Dose: 0.3-1.3 Gm. (gr. v-xx.)

SOLUTION, AMMONIUM ACETATE.

Spirit Mindererus. Diaphoretic; antipyretic; diuretic.

Uses: fevers, dysmenorrhœa, mumps, scarlatina, etc.

Dose: 16 c.c. (fldr. iv).

SOLUTION, ARSENIC AND MERCURIC IODIDE.

—See Mercuric Iodide, Red.

SOLUTION, CALCIUM HYDRATE.

Lime water. Antacid; astringent. Uses: sour stomach, diarrhoea, dysentery, diabetes, vomiting, dyspepsia; also *externally* as liniment (with linseed or other oil) for burns, etc. Dose: 16 c.c. (fldr. iv).

Preparation: liniment.

SOLUTION, DONOVAN'S.—See Solution, Arsenic and Mercuric Iodides.**SOLUTION, FOWLER'S.**

Solution of potassium arsenite. Alterative; antiperiodic; tonic. Uses: chorea, skin disease; intermittent fever, malarial affections, periodic neuralgia, chronic rheumatism, etc. Never give on an empty stomach.

Dose: 0.2 c.c. (m iii).

SOLUTION, HYDROGEN PEROXIDE.

3 per cent. H_2O_2 (10 volumes available O). For action and uses see Perhydrol.

SOLUTION, IODINE, COMPOUND.—See Iodine.

SOLUTION, IRON AND AMMONIUM ACETATE.

Basham's mixture. Hæmatinic; astringent. Dose: 16 c.c. (fldr. iv).

SOLUTION, LEAD SUBACETATE.

Goulard's acetate. 25 per cent. Astringent; antiseptic. Used chiefly to make diluted solution (lead water) and cerate (20 per cent.) for application to burns, sprains, bruises, and for use in eye washes, and for erysipelas, gonorrhœa, etc.

SOLUTION, MAGNESIUM CITRATE.

Laxative; refrigerant. Dose: 360 c.c. (froz. xii).

SOLUTION, LUGOL'S.—See Solution of Iodine Compound.

SOLUTION, POTASSIUM ARSENITE.—See Fowler's Solution.

SOLUTION, POTASSIUM HYDRATE.—See Potassium Hydrate.

SOLUTION, SODA, CHLORINATED.

Labarraque's solution. 2.6 per cent. available chlorine. Disinfectant; antizymotic. Uses: malignant scarlatina, typhoid fever, putrid sore throat, glandular enlargements. Dose: 1 c.c. (m xv).

SOLUTION, SODIUM ARSENATE.—See Sodium Arsenate.

SOLUTION, SODIUM HYDRATE.—See Sodium Hydrate.

SPARTEINE SULPHATE.

Soluble in water or alcohol. Diuretic; heart remedy. Uses: *internally*, where digitalis fails or is contraindicated. Dose: 0.01 Gm. (gr. $\frac{1}{4}$).

SPEARMINT.

Carminative; stimulant. Uses: flatulence, colic, dysentery, rheumatism, neuralgia, etc. Dose: 4 Gm. (gr. i). Preparations: water, 16 c.c. (fldr. iv); spirit, 2 c.c. (℥ xxx).

SPIGELIA.

Pinkroot. Anthelmintic. Dose: 4 Gm. (dr. i). Preparation: fluidextract, 4 c.c. (fldr. i).

SPIRIT, GLONIN.

Spirit (solution) of nitroglycerin (trinitrin) 1 per cent. Antispasmodic; vasodilator; arterial stimulant. Uses: angina pectoris, convulsions, asthma, heart disease, poisoning by carburetted hydrogen, headache, neuralgia, etc. Dose: 0.05 c.c. (℥ i).

SPIRIT, MINDERERUS.—See Solution, Ammonium Acetate.

SPIRIT, NITROUS ETHER.

Sweet spirit of nitre. Diaphoretic; diuretic; antipyretic; stimulant; antispasmodic. Uses: fevers, dropsy, diseases of the genito-urinary organs, flatulent colic, nausea, colds, etc. Dose: 2 c.c. (℥ xxx).

SQUILL.

Expectorant; emetic; diuretic. Uses: coughs, colds, croup, dropsy. Dose: 0.125 Gm. (gr. ii). Preparations: fluidextract, 0.1 Gm. (gr. xv); tincture (10 per cent.), 1 c.c. (℥ xv); vinegar, 1 c.c. (℥ xv); syrup, 2 c.c. (℥ xxx); compound syrup, 2 c.c. (℥ xxx).

STAPHISAGRIA.

Stavesacre. Parasiticide. Uses: *externally* in substance or 1:16 solution of fluidextract in dilute acetic acid in itch, and for pediculi.

STILLINGIA.

Queen's root. Alterative; resolvent. Uses: syphilis, skin diseases, scrofula, etc. Dose: 2 Gm. (℥ xxx). Preparation: fluidextract, 2 c.c. (℥ xxx).

STRAMONIUM.

Narcotic; sedative; analgesic. Uses: *internally*, epilepsy, rheumatism, dysmenorrhœa, spasmodic asthma, chorea; *externally*, as ointment in ulcers and hemorrhoids; also in cigarettes in asthma. Dose: 0.065 Gm. (gr. i). Preparations: extract, 0.01 Gm. (gr. $\frac{1}{8}$); fluidextract, 0.05 c.c. (m i); tincture (10 per cent.), 0.5 c.c. (m viii); ointment.

STRONTIUM BROMIDE.

Colorless, odorless, deliquescent crystals; bitter saline taste. Soluble in about 2 parts of water, freely in alcohol. Gastric tonic; nerve sedative; antiepileptic. Uses: hyperacidity of stomach, gout, epilepsy, nervousness, hysteria, headache, etc. Dose: 1 Gm. (gr. xv).

STRONTIUM SALICYLATE.

Soluble in about 55 parts of water, soluble in alcohol. Antirheumatic; intestinal antiseptic. Uses: rheumatism, chorea, muscular pains, pleurisy, intestinal fermentation. Dose: 1 Gm. (gr. xv).

STROPHANTHIN.

White powder, very bitter taste. Soluble in water or alcohol. Heart tonic; vasoconstrictor; non-diuretic. Use: see Digitalin. Dose: 0.0005–0.001 Gm. (gr. $\frac{1}{16}$ – $\frac{1}{80}$).

STROPHANTHUS.

ACTION AND USES: as strophanthin. Dose: 0.065 Gm. (gr. i). Preparation: tincture (10 per cent.), 0.5 c.c. (m viii).

STRYCHNINE.

Soluble in 110 parts of water, 6700 of alcohol. Bitter tonic; stimulant; stomachic. Uses: *internally*, palsy, chronic alcoholism, dyspepsia, anæmia, insomnia from mental overwork, etc. Dose: 0.001 Gm. (gr. $\frac{1}{60}$).

STRYCHNINE NITRATE.

White needles or powder. Soluble in about 50 parts of water, 60 of alcohol. Uses, dose, etc.: as of strychnine. Most frequently used in dipsomania.

STRYCHNINE SULPHATE.

Soluble in about 50 parts of water, 110 of alcohol. Uses, dose, etc.: as of strychnine.

STYPTICIN. P.

Cotarnine hydrochlorate. Yellow powder. Soluble in water or alcohol. Hæmostatic; uterine sedative; styptic. Uses: highly extolled in atypical uterine hemorrhages not dependent upon neoplasms or retained fragments of ovum or upon marked endometritis. Reported excellent also in prolonged or excessive menstruation, particularly in young girls, as effective in purely climateric hemorrhages, dysmenorrhœa, and hæmoptysis; also to be very efficacious in nose-bleed and in hemorrhage following tooth extraction. Dose: 0.1-0.25 Gm. (gr. $1\frac{1}{2}$ -iv) 4 or 5 times daily.

SULFONAL. P.

Colorless tasteless crystals. Soluble in about 500 parts of water, 110 of dilute alcohol. Hypnotic; sedative. Uses: insomnia, epilepsy, night-sweats, hiccough, chordee, etc. Dose: 1 Gm. (gr. xv).

SULPHUR.

Lac sulphuris; milk of sulphur. Laxative; alterative; antiseptic; diaphoretic. Uses: *internally*, rheumatism, catarrh, asthma, hemorrhoids, sciatica, skin diseases; *externally*, in ointment, in scabies, and other skin affections. Dose: 4 Gm. (dr. i). Preparation: ointment (15 per cent.).

SULPHUR, SUBLIMED.

Flowers of sulphur. Intended for external use only in scabies, skin diseases, etc.

SULPHUR, WASHED.

ACTION AND USES: as sulphur, pure. Dose: 4 Gm. (dr. i).

SUPRARENAL CAPSULE, DRIED.

1 part represents 5 parts fresh capsule. Alterative; nervine. USES: Addison's disease, diabetes insipidus, neurasthenia, rhachitis, cyclic albuminuria, climacteric disturbances, etc. Dose: 0.25 Gm. (gr. iv).

SYRUP, HYDRIODIC ACID.—See Acid, Hydriodic.

SYRUP, HYPOPHOSPHITES.—See Sodium Hypophosphite.

SYRUP, IRON IODIDE.

10 per cent. ferrous iodide. Alterative; hæmatinic. USES: scrofulous affections, tuberculosis, chronic rheumatism, leucocythæmia, chlorosis, anæmia. Dose: 1 c.c. (℥ xv).

SYRUP, LIME.

Antacid, antidote to carbolic acid, oxalic acid, etc. Dose: 2 c.c. (℥ xxx).

TAKA DIASTASE. P.

(Diastase takamine.) Brownish powder; almost tasteless. Soluble in water, insoluble in alcohol. Starch digestant (1 part stated to convert over 100 parts of dry starch). USES: in amylaceous dyspepsia. Dose: 0.06–0.3 Gm. (gr. i–v).

TANNALBIN. P.

Tannin albuminate exsiccated, Knoll. Light brown, odorless, tasteless powder; 50 per cent. tannin. Insoluble in water. Dose: 1–4 Gm. (dr. $\frac{1}{4}$ –1).

TANNIGEN. P.

Diacetyl tannin. Gray, hygroscopic powder; almost odorless and tasteless. Soluble in alkaline fluids or alcohol, insoluble in water. Intestinal astringent. Dose: 0.3–2 Gm. (gr. v–xxx).

TANNOFORM. P.

Tannin formaldehyde. Loose, reddish powder. Soluble in alcohol, insoluble in water. Siccative antiseptic and deodorant. **USES:** hyperidrosis, bromidrosis, weeping eczema, ozena, etc. Applied pure or in 25-50 per cent. triturations.

TAR.

Antiseptic; antispasmodic. **USES:** *internally*, bronchial affections, colds, fevers, diarrhoea, etc.; *externally*, skin diseases. **DOSE:** 0.5 Gm. (gr. viii). Preparations: syrup, 4 c.c. (fldr. i); ointment (50 per cent.).

TARAXACUM.

Dandelion. Bitter tonic; hepatic stimulant. **USES:** liver disease with dyspepsia, and constipation. **DOSE:** 8 Gm. (dr. ii). Preparations: extract, 1 Gm. (gr. xv); fluid extract, 8 c.c. (fldr. ii).

TARTAR EMETIC.—See Antimony and Potassium Tartrate.

TEREBENE.

Colorless or slightly yellowish liquid; thyme-like odor; resinifies in light. Soluble in alcohol, slightly soluble in water. Expectorant; antiseptic; antifermentative. **USES:** *internally*, in chronic bronchitis, flatulent dyspepsia, genito-urinary diseases, phthisis, bronchitis, etc.; *externally*, skin diseases; in phthisis by inhalation (about 2 oz. a week). **DOSE:** 0.25-1.3 Gm. (gr. iv-xx), externally, in 1 per cent. solution.

TERPIN HYDRATE.

Colorless prisms; slightly bitter taste. Soluble in about 10 parts of alcohol, 250 of water. Expectorant; antiseptic; diuretic; diaphoretic. **USES:** bronchial affections, whooping-cough, throat affections, tuberculosis. **DOSE:** 0.125 Gm. (gr. ii).

THEINE.—See Caffeine.

THEOBROMINE.

White powder; bitter taste. Insoluble in water. Diuretic; nerve stimulant. **Uses:** cardiac dropsy. **Dose:** 0.3–1 Gm. (gr. v–xv).

THEOBROMINE AND SODIUM SALICYLATE.

White odorless powder; decomposed by exposure. Diuretic. **Uses:** cardiac dropsy; nephritis, especially after scarlatina. **Dose:** 1 Gm. (gr. xv), 5 or 6 times daily.

THEOCIN. P.

Theophyllin. Colorless crystals. Soluble with difficulty in cold water and alcohol. Diuretic. **Dose:** 0.2–0.5 Gm. (gr. iii–viii).

THYROIDIN. P.

Dried extract of sheep's thyroid; 1 part represents 6 parts of fresh gland. Whitish powder. Alterative, antifat. **Uses:** myxœdema, cretinism, psoriasis, obesity, etc. **Dose:** 0.25 Gm. (gr. iv).

TINCTURE, ACONITE.—See Aconite.

TINCTURE, ARNICA FLOWERS.

Antiseptic. **Uses:** *externally*, chiefly in bruises and other injuries.

TINCTURE, HYDRASTIS.—See Hydrastis.

TINCTURE, HYOSCYAMUS.—See Hyoscyamus.

TINCTURE, IRON CHLORIDE.

Hæmatinic; astringent. **Uses:** chlorosis, anæmia, etc. **Dose:** 0.5 Gm. (dr. viii).

TINCTURE, NUX VOMICA.—See Nux Vomica.

TINCTURE, PULSATILLA.

Antispasmodic; sedative; anodyne. **Uses:** *internally*, asthma, whooping-cough, spasmodic dysmenorrhœa, orchitis, etc. **Dose:** 0.3–1.3 c.c. (m̄ v–xv).

TINCTURE, STRAMONIUM.—See Stramonium.

TINCTURE, STROPHANTHUS.—See Strophanthus.

TINCTURE, VERATRUM VIRIDE.—See Veratrum Viride.

TRIKRESOL. P.

Clear liquid; cresolic odor. Soluble in 40 parts of water. Disinfectant. Application; in $\frac{1}{4}$ -1 per cent. solution.

TRIONAL. P.

Diethylsulphonemethylethylmethane. White powder; faint bitter taste. Soluble in about 320 parts of water. Hypnotic; sedative. Uses: for producing sleep, especially where there is no pain. Dose: 1 Gm. (gr. xv).

TRITICUM.

Cough-grass. Demulcent; diuretic. Uses: cystitis and other diseases of the genito-urinary organs. Dose: 8 Gm. (dr. ii). Preparation: fluidextract, 8 c.c. (fldr. ii).

URETHANE.

Ethyl urethane: ethyl carbamate. Colorless crystals; faint peculiar odor; saltpetre like taste. Soluble in about 1 part of alcohol or water. Hypnotic; antispasmodic; sedative. Uses: insomnia, eclampsia, nervous excitement, tetanus; and as antidote in strychnine, resorcin, or picrotoxin poisoning. In eclampsia it should be given per enema. Dose: 2-3 Gm. (dr. $\frac{1}{2}$ -1).

VALERIAN.

Nerve sedative; antispasmodic; anodyne. Uses: hysteria, epilepsy, hypochondria, headache, etc. Dose: 2 Gm. (gr. xxx). Preparations: fluidextract, 2 c.c. (m xxx); tincture (20 per cent.), 4 c.c. fldr. i); ammoniated tincture, 2 c.c. (m xxx).

VERATRUM VIRIDE.

American hellebore. Cardiac depressant; diaphoretic; diuretic. *Uses:* fevers, acute inflammations as pneumonia, mania, puerperal convulsions, etc. *Dose:* 0.002 Gm. (gr. $\frac{1}{80}$). *Preparations:* oleate; ointment.

VERONAL. P.

Diethylmalomylurea. White crystalline powder; faintly bitter taste. Soluble in about 12 parts of boiling water. Hypnotic. *Uses:* simple agrypnia, and in insomnia accompanying hysteria, neurasthenia, and mental disturbances. *Dose:* 0.3-1 Gm. (gr. v-xv).

VIBURNUM COMPOUND. P.

Antispasmodic; nervine. *Uses:* dysmenorrhœa, menorrhagia, metrorrhagia. *Dose:* 4-8 c.c. (fldr. i-ii).

VIBURNUM PRUNIFOLIUM.—See Black Haw.

WHITE PRECIPITATE.—See Mercury-ammonium Chloride.

WILD CHERRY BARK.

Astringent; tonic; sedative. *Uses:* bronchitis, general or local irritation, debility, coughs, colds, etc. *Dose:* 2 Gm. (gr. xxx). *Preparations:* fluidextract, 2 c.c. (m xxx); syrup, 4 c.c. (fldr. i); infusion, 60 c.c. (flox. iv).

ZINC CARBONATE.

Uses: Wounds, ulcers, skin diseases, etc., also face powder; *externally*, pure or in 20 per cent. ointment or powder.

ZINC CHLORIDE.

Soluble in about $\frac{1}{2}$ part of water, 1 part of alcohol. Alterative; antispasmodic; escharotic. *Uses:* *internally*, epilepsy, chorea, scrofula, syphilis, etc.; *externally* caustic in nævi, cancerous affections, superabundant granulations, aneurisms, etc. *Dose:* 0.006 Gm. (gr. $\frac{1}{16}$).

ZINC OXIDE.

Antispasmodic; antiseptic; mild sedative. **USES:** *internally*, chorea, epilepsy, chronic diarrhoea, etc.; *externally* (in 5-20 per cent. solution), wounds, skin diseases, etc. **DOSE:** 0.25 Gm. (gr. iv). **Preparation:** ointment.

ZINC PHOSPHIDE.

Insoluble in water or alcohol. Nervous stimulant. **USES:** sexual exhaustion, cerebral affections, melancholia, and chronic skin diseases. **DOSE:** 0.003-0.015 Gm. (gr. $\frac{1}{20}$ - $\frac{1}{4}$) in pill.

ZINC STEARATE.

White agglutinating powder; turns darker on exposure. Insoluble in water. Antiseptic; astringent. **USES:** gonorrhoea, atrophic rhinitis, etc. Applied in substance or combined in form of the official ointment.

ZINC SULPHATE.

White vitriol; zinc vitriol. Soluble in about 1 part of water; insoluble in alcohol. Emetic; astringent; antiseptic; escharotic. **USES:** *internally*, gastric catarrh, nervous affections, night-sweats, etc.; *externally*, in gonorrhoea ($\frac{1}{2}$ -2 per cent. solution); ophthalmia (1:1000), skin diseases (1:10-1:20 ointment). **DOSE:** 1 Gm. (gr. xv) as emetic.

ZINC SULPHOCARBOLATE.

Colorless crystals. Soluble in about 5 parts of water or alcohol. Antiseptic; astringent. **USES:** gonorrhoea, foul ulcers, etc.; *internally*, typhoid, fermentative diarrhoea, etc. **DOSE:** 1 Gm. (gr. xv).

ZINC VALERIANATE.

Decomposes on exposure. Soluble in about 40 parts of alcohol, 120 of water. Antispasmodic; tonic. **USES:** diabetes insipidus, nervous affections, neuralgia, etc. **DOSE:** 0.125 Gm. (gr. ii).

PART VI.

THERAPEUTIC DEFINITIONS.

Alteratives: Drugs which, when taken internally, produce a healthy reaction in abnormal tissues.

Analgesics: Drugs which diminish pain.

Anaphrodisiacs: Drugs depressing the sexual centres.

Anæsthetics: Drugs abolishing sensation.

Anodynes: See Analgesics.

Antacids: Drugs diminishing acidity of stomach contents.

Anthelmintics: Drugs which kill intestinal worms.

Anti-Emetics: Drugs preventing vomiting.

Antigalactogues: Drugs decreasing milk secretion.

Antihydrotics: Drugs diminishing the excretion of sweat.

Antiperiodics: Drugs used in malaria.

Antiphlogistics: Applications which reduce inflammation.

Antipyretics: Remedies that reduce fever.

Antirheumatics: Remedies to combat rheumatism.

Antisialagogues: Drugs decreasing salivary secretion.

Antispasmodics: Drugs depressing the spinal cord.

Antiseptics: Drugs which prevent contagion or sepsis.

Astringents: Drugs which cause tissues to contract.

Cardiac Sedatives: Drugs which diminish the work done by the heart.

Cardiac Stimulants: Drugs which increase the work done by the heart.

Carminatives: Drugs causing a feeling of warmth in the stomach and causing flatus to be expelled.

Cathartics: Drugs which cause a vigorous and copious bowel evacuation.

Caustics: See Escharotics.

Cerebral Stimulants: Drugs which stimulate the higher brain centres.

Counterirritants: Drugs which redden or blister the skin when applied locally.

Demulcents: Drugs which have a sedative action on the mucous membrane of the alimentary tract.

Deodorants: Drugs which remove or obscure offensive odors.

Depilatories: Drugs which remove hair.

Diaphoretics: See Sudorifics.

Digestives: Drugs which aid digestion.

Disinfectants: Drugs which prevent infection by destroying germs.

Diuretics: Drugs which increase the urinary flow.

Ecbolics: See Oxytocics.

Emetics: Drugs which produce vomiting.

Emmenagogues: Drugs inducing or increasing menstrual flow.

Escharotics: Drugs destroying tissue by local application.
Caustics.

Expectorants: Drugs increasing bronchial secretion.

Galactagogues: Drugs increasing the secretion of milk.

Germicides: See Disinfectants.

Hæmatinics: Drugs increasing the hæmoglobin of the blood.

Hæmostatics: Drugs controlling hemorrhage.

Laxatives: Drugs producing a mild cathartic action.

Mydriatics: Drugs producing dilatation of the pupil of the eye.

Myotics: Drugs producing contraction of the pupil of the eye.

Narcotics: Drugs causing extreme depression of the activity
of the brain shown by stupor.

Nervines: Drugs having a beneficial action on nerve function.

Nutrients: Foods.

Oxytocics: Drugs inducing uterine contractions.

Parasiticides: Drugs killing animal parasites.

Purgatives: See Cathartics.

Refrigerants: Saline drugs usually used to combat fever.

Respiratory Depressants: Drugs depressing the respiratory
centre in the medulla.

Rubefacients: Mild counterirritants, intended to be applied
with friction.

Stomachics: Drugs intended to improve the tone of the
stomach.

Styptics: Drugs locally applied to control hemorrhage.

Sudorifics: Drugs inducing perspiration.

Tæniacuges: See Anthelmintics.

Tonics: Drugs increasing the functional activity of the body
or any of its organs.

Vasoconstrictors: Drugs causing a dilatation of the blood-ves-
sels of the body.

Vasodilators: Drugs causing a constriction of the blood-vessels
of the body.

Vascular Tonics or Sedatives: See Cardiac Sedatives.

Vesicants: See Counterirritants.

<i>Ad</i>	<i>Ad</i>	To, or up to.
<i>Ad lib</i>	<i>Ad libitum</i>	At pleasure.
<i>Admov</i>	<i>Admoveatur</i>	Apply.
<i>Alt. hor</i>	<i>Alterius horis</i>	Every other hour.
<i>A. or aa</i>	<i>Ana</i>	Of each.
<i>Aq. bull</i>	<i>Aqua bulliens</i>	Boiling water.
<i>Aq. ferv</i>	<i>Aqua fervens</i>	Hot water.
<i>Aq. font</i>	<i>Aqua fontana</i>	Spring water.
<i>Arg</i>	<i>Argentum</i>	Silver.
<i>Au</i>	<i>Aurum</i>	Gold.
<i>Aut</i>	<i>Aut</i>	Or.
<i>Bene</i>	<i>Bene</i>	Well.
<i>Bib</i>	<i>Bibe</i>	Drink.
<i>Bis</i>	<i>Bis</i>	Twice.
<i>B. i. d</i>	<i>Bis in die</i>	Twice a day.
<i>Bull</i>	<i>Bulliat</i>	Let it boil.
<i>C</i>	<i>Cum</i>	With.
<i>Cap</i>	<i>Capiat</i>	Let him take.
<i>Capsul</i>	<i>Capsula</i>	A capsule.
<i>Chart</i>	<i>Charta</i>	Paper.
<i>C. m</i>	<i>Cras mane</i>	To-morrow morning.
<i>C. n</i>	<i>Cras nocte</i>	To-morrow night.
<i>Coch. parv</i>	<i>Cochleare parvum</i>	A teaspoonful.
<i>Coch. amp</i>	<i>Cochleare amplum</i>	A dessertspoonful.
<i>Coch. mag</i>	<i>Cochleare magnum</i>	A tablespoonful.
<i>Cong</i>	<i>Congius</i>	A gallon.
<i>Dil</i>	<i>Dilue</i>	Dilute.
<i>D. in p</i>	<i>Dividatur in partes</i> { <i>æquales</i>	Let it be divided into equal parts.
<i>Emp</i>	<i>Emplastrum</i>	A plaster.
<i>F. pil. xii</i>	<i>Fac pilulas duodecim</i>	Make twelve pills.
<i>Ft</i>	<i>Fiat</i>	Let it be made.
<i>Filt</i>	<i>Filtra</i>	Filter.
<i>Gtt</i>	<i>Guttæ</i>	Drops.
<i>Hor. som</i>	<i>Hora somni</i>	At the hour of sleep.
<i>Mane</i>	<i>Mane</i>	In the morning.
<i>M</i>	<i>Misce</i>	Mix.
<i>O. D</i>	<i>Oculus dexter</i>	Right eye.
<i>O. S</i>	<i>Oculus sinister</i>	Left eye.
<i>Omn. hor</i>	<i>Omni hora</i>	Every hour.
<i>Post cib</i>	<i>Post cibum</i>	After eating.
<i>Red. in pulv</i>	<i>Redactus in pulverem</i> {	Let it be reduced to a powder.
<i>Sig</i>	<i>Signetur</i>	Let it be labeled.
<i>Tab</i>	<i>Tabella</i>	A lozenge, or tablet.
<i>T. i. d</i>	<i>Ter in die</i>	Three times a day.
<i>Ter. sim</i>	<i>Tere simul</i>	Rub together.
<i>Trit</i>	<i>Tritura</i>	Triturate.
<i>Ut dict</i>	<i>Ut dictum</i>	As directed.

1

INDEX.

- Acetanilid, 88, 114
 Acid, acetic, 115
 glacial, 115
 diluted, 115
 agaricic, 115
 arsenous, 45, 115
 benzoic, 115
 boric, 116
 carbolic, 92, 116
 chromic, 116
 citric, 116
 gallic, 117
 hydriodic, 118
 hydrobromic, 117
 hydrochloric, 117
 hydrochloric, diluted,
 117
 hydrocyanic, diluted,
 117
 hypophosphorous, di-
 luted, 118
 lactic, 118
 nitric, 118
 diluted, 118
 nitrohydrochloric, di-
 luted, 118
 oxalic, 119
 phosphoric, diluted, 119
 picric, 119
 pyrogallic, 119
 salicylic, 119
 sulphuric, aromatic, 120
 diluted, 120
 sulphurous, 120
 tannic, 120
 tartaric, 120
 trichloracetic, 120
 Aconite, root, 58, 121
 Adrenalin, 71, 121
 Agaricin, 121
 Agurin, 121
 Alcohol, 92, 121
 Aletris, cordial, 122
 Alkali metals, salts of, 32
 Alkalithia, 122
 Alkaloids, 57
 Aloes, socotrine, 83, 122
 purified, 122
 Aloin, 122
 strychnia, and bella-
 donna, pills of, 83
 Ammonia, 32
 water, 122
 stronger, 123
 Ammonium benzoate, 123
 bromide, 33, 123
 carbonate, 37, 123
 chloride, 38, 123
 iodide, 35, 124
 Ammonol, 124
 Amyl nitrite, 99, 124
 Anæsthetics, 93
 Analgin, 124
 Antifebrin, 124
 Antimony and potassium
 tartrate, 124
 Antipyretics, coal-tar, 88
 Antipyrin, 88, 124
 Antitoxin, diphtheria, 103,
 125
 Antitoxins and vaccines, 102
 Apiol, 125
 Apioline, 125
 Apomorphine hydrochlo-
 rate, 125
 Argonin, 125
 Argyrol, 54, 126
 Aristol, 126
 Arsenauro, 126
 Asafetida, 126
 Aspirin, 126
 Atoxyl, 126
 Atropine, 72, 126
 sulphate, 72, 127
 Balsam Peru, 127
 Belladonna leaves, 72, 127
 root, 72, 127

- Benzoin, 127
 Bismuth and ammonium
 citrate, 129
 beta-naphtholate, 127
 citrate, 128
 formic iodide, 128
 paste, 56
 salicylate, 128
 subcarbonate, 128
 subnitrate, 56, 128
 Black haw, 129
 Borolyptol, 129
 Bromides, 33
 Bromidia, 98, 129
 Bromine, 129
 Bromism, 33
 Bromoform, 129
 Buchu, 129

 Caffeine, 66, 130
 citrated, 68, 130
 sodium benzoate, and,
 68, 130
 Calcium bromide, 130
 carbonate, precipitated,
 130
 prepared, 130
 chloride, 131
 Calumba, 131
 Camphor, 68, 131
 monobromated, 131
 Cannabis indica, 131
 Cantharides, 132
 Capsicum, 132
 Cardamom, 132
 Cascara sagrada, 83, 132
 Catechu (Gambir), 132
 Cathartics, saline, and "salt
 action," 39
 vegetable, 83
 Cerium oxalate, 57, 132
 Chalk (see *Calcium carbonate*)
 Charcoal, 133
 Chloralamide, 133
 Chloral hydrate, 97, 133
 Chloretone, 98, 133
 Chloroform, 95, 133
 Chrysarobin, 134
 Cimicifuga, 134

 Cinchona, 134
 Cinchonidine, 134
 Coca, 134
 Cocaine hydrochlorate, 100,
 135
 Codeine, 78, 135
 Colchicine, 135
 Colchicum root, 135
 seed, 135
 Colchi-sal, 135
 Collargol, 136
 Collodion, cantharidal, 136
 styptic, 136
 Colocynth, 136
 Conium, 136
 Convallaria, 136
 Copaiba, 136
 Copper sulphate, 137
 Corrosive sublimate (see
 Mercury bichloride)
 Cotton-root bark, 137
 Creolin, Pearson, 137
 Creosotal (see *Creosote car-
 bonate*)
 Creosote, 92, 137
 carbonate, 138
 Cubebs, 138
 Cystogen, 101

 Definitions, 9
 therapeutic, 185
 Dermatol (see *Bismuth sub-
 gallate*)
 Digalin, 60
 Digitalin, 60, 138
 Digitalis, 138
 Dioxygen (see *Perhydrol*)
 Diuretin, 68, 138
 Dosage, general rules of, 21
 Young's rule, 19
 Dover's powder (see under
 Opium, powdered)
 Drugs, action of, 23, 29
 chief uses of, 31
 reference-list of, 114
 Duotal, 139

 Elaterin, 139
 Elixir phosphate of iron,
 quinine, and strychnia, 48

- Enemata, 108
 Ergot, 70, 139
 Ergotin, 139
 Eriodictyon, 139
 Erythrol tetranitrate, 139
 Ether, 95, 140
 Ethyl chloride, 140
 Eucaïne, beta, 140
 Eucalyptol, 140
 Eucalyptus, 141
 Euquinine, 82, 141
 Euthymol, 141
 Extract, bone-marrow, 141
 male fern, 141
 opium, aqueous, 141
 thyroid, 105, 141
 Formaldehyde, 142
 Formalin or Formol (see *Formaldehyde*), 142
 Formin (P), 142
 Frangula, 142
 Gall, ox, purified, 142
 Gelseminine, 142
 Gelsemium, 143
 Gentian, 143
 Ginger, 143
 Glands, suprarenal, 71
 Glucosides, 57
 Glyco-thymoline, 143
 Glycozone, 143
 Glycyrrhiza, 143
 Gold chloride, 144
 sodium chloride, and, 144
 Gray powder, 50
 Grindelia, 144
 Guaiac, 144
 Guaiacol, 144
 carbonate, 144
 Guarana, 145
 Hæmatoxylon, 145
 Hamamelis, 145
 Heart sedatives, 58
 stimulants, 60
 Hedeoma, 145
 Hellebore, 59
 Helmitol, 145
 Heroin, 78, 145
 hydrochlorate, 78, 145
 Hexamethylenetetramine
 (see *Formin*), 145
 Holocaine hydrochlorate, 146
 Homatropine hydrobromate, 74, 146
 Hydrastine hydrochlorate, 146
 Hydrastis, 146
 Hydrogen peroxide, 146
 Hydrozone, 146
 Hyoscine hydrobromate, 75, 147
 Hyoscyamus, 74, 147
 Ichthyol, 92, 147
 Ingluvin, 147
 Iodine, 147
 Iodism, 35
 Iodoform, 148
 Ipecac, 148
 Iron, 46
 ammonium citrate, and, 149
 carbonate, 148
 hydrogen, by, 148
 potassium tartrate, and, 149
 quinine citrate, and, 149
 sulphate, 49, 148
 Jalap, 149
 Kino, 149
 Lactopeptine, 149
 Lactose, 149
 Lactucarium, 149
 Lanolin, 149
 Lanum, 150
 Latin, medical, 187
 Lead acetate, 150
 Lime sulphurated, 150
 water, 150
 Liquor, 150
 Listerine, 150
 Lithium bromide, 33

- Lithium, citrate, 150
 salicylate, 90, 150
 Lobelia, 151
 Lunar caustic (see *Silver nitrate*), 151
 Lysol, 151
 Magnesium carbonate, 151
 oxide, 151
 sulphate, 39, 151
 Medication, hypodermatic, 107
 rectal, 108
 Menthol, 151
 Mercury, 50, 152
 ammoniated, 52, 152
 bichloride, 50, 152
 chalk, with, 50
 chloride, mild, 50, 152
 cyanide, 152
 iodide, red, 153
 iodide, yellow (or green), 51, 153
 salicylate, 153
 succinamide, 153
 Mesotan, 153
 Methyl salicylate, 154
 Methylene blue, 154
 Methylmorphine (see *Cocaine*), 154
 Milk of magnesia, 154
 sugar, 154
 Mixture, Basham's, 48
 Morphine sulphate, 80, 154
 Musk, 154
 Mydriatics, 72
 Myrrh, 154
 Naphthalin, 155
 Naphthol, beta, 155
 Nutgall, 155
 Nutmeg, 155
 Nux vomica, 64, 155
 Official preparations, definitions, 10
 general dosage rules, 21
 Oil, almond, bitter, 156
 betula, 156
 cade, 156
 cajuput, 156
 castor, 84, 156
 cod-liver, 156
 croton, 84, 156
 eucalyptus, 156
 gaultheria, 157
 juniper berries, 157
 mustard, 157
 olive, 157
 pinus, 157
 santal, 157
 tar, 158
 turpentine, 158
 wintergreen, artificial (see *Methyl salicylate*), 158
 true (see *Oil, gaultheria*), 158
 Ointment, ammoniated mercury, 52
 mercurial, 52
 mercuric nitrite, 158
 Oleate, mercury, 158
 Oleoresin, capsicum, 158
 male fern, 158
 Opium, 76, 158
 powdered, 76, 158
 Orphol, 159
 Orthoform, 100, 159
 Pancreatin, 105, 159
 Papain, 159
 Paraldehyde, 160
 Pelletierine tannate, 160
 Peppermint, 160
 Pepsin, 105, 160
 saccharated, 160
 Peptenzyme, 160
 Pepto-mangan, 160
 Perhydrol, 161
 Phenacetin, 88, 151
 Phenalgin, 161
 Phenazone, 161
 Phenol, 92, 161
 Phenolphthalein, 84
 Phenylacetamide, 161
 Phenyl salicylate, 161
 Phosphorus, 161

- Physostigma, 161
 Physostigmine salicylate, 162
 Phytolacca root, 162
 Picrotoxin, 162
 Pilocarpine hydrochlorate, 162
 Pilocarpus, 162
 Piperazine, 163
 Podophyllin, 163
 Podophyllum, 163
 Pomegranate, 163
 Potassa, 163
 sulphurated, 163
 Potassium acetate, 163
 bicarbonate, 164
 bichromate, 164
 bitartrate, 164
 bromide, 33, 164
 carbonate, 164
 chlorate, 165
 citrate, 165
 cyanide, 165
 glycerinophosphate, 165
 hydrate, 165
 hypophosphite, 165
 iodide, 35, 166
 nitrate, 166
 permanganate, 55, 166
 sodium tartrate, and, 39, 166
 Protargol, 55, 166
 Pumpkin seed, 166
 Purgative oils, 84
 Purgatives, vegetable, 83
 Pyrogallol, 167
 Quassia, 167
 Quinine, 81, 167
 bisulphate, 81, 167
 sulphate, 81, 167
 tannate, 82, 167
 urea hydrochlorate, and, 81, 167
 Resin, jalap, 168
 podophyllum, 168
 scammony, 168
 Resinol, 168
 Resorcin, 168
 Rhubarb, 168
 Rochelle salt, 168
 Rubus, 168
 Saccharin, 169
 Salicin, 169
 Salol, 169
 Salophen, 169
 Salt, Epsom, 169
 Glauber's, 169
 Rochelle, 169
 Saltpetre, 169
 Sanguinaria, 170
 Santonin, 170
 Sarsaparilla, 170
 Scammony, 170
 Scoparius, 170
 Scopolamine hydrobromate, 170
 Senega, 170
 Senna, 83, 171
 Silver, albuminates of, 54
 nitrate, 53, 171
 molded, 53, 171
 diluted, 53, 171
 Sodium acetate, 171
 arsenate, 171
 benzoate, 172
 bicarbonate, 172
 borate, 172
 bromide, 33, 172
 cacodylate, 172
 citrate, 172
 glycerinophosphate, 173
 hydrate, 173
 hypophosphite, 173
 iodide, 35
 nitrite, 173
 phosphate, 39, 173
 salicylate, 90, 173
 sulphate, 174
 thiosulphate, 174
 Solution, ammonium acetate, 174
 arsenic and mercuric iodide, 45, 174
 calcium hydrate, 174
 Donovan's 45, 174

- Solution, Fowler's, 45, 174
 hydrogen peroxide, 174
 iodine compound, 175
 iron and ammonium
 acetate, 48, 175
 lead subacetate, 175
 Lugol's, 175
 magnesium citrate, 175
 potassium arsenite, 45,
 175
 soda, chlorinated, 175
 sodium arsenate, 45, 175
 hydrate, 175
 Solutions, antiseptic, 110, 113
 Sparteine sulphate, 175
 Spearmint, 176
 Spigelia, 176
 Spirit, mindererus, 176
 nitroglycerin (glonoin),
 99, 176
 nitrous ether, 176
 Squill, 176
 Staphisagria, 176
 Stillingia, 176
 Stramonium, 177
 Strontium bromide, 177
 salicylate, 90, 177
 Strophanthin, 63, 177
 Strophanthus, 63, 177
 Strychnine, 64, 177
 nitrate, 178
 sulphate, 178
 Stypticin, 178
 Sulfonal, 178
 Sulphur, 178
 sublimed, 178
 washed, 179
 Suprarenal capsule, dried,
 71, 179
 Syrup, hydriodic acid, 179
 hypophosphites, 179
 iron iodide, 179
 lime, 179

 Taka diastase, 179
 Tannalbin, 179
 Tannigen, 179
 Tannoform, 180
 Tar, 180

 Taraxacum, 180
 Tartar emetic, 180
 Terebene, 180
 Terpin hydrate, 180
 Theine, 181
 Theobromine, 68, 181
 sodium salicylate, and,
 68, 181
 Theocin, 181
 Thyroid, extract of, 105, 181
 Thyroidin, 105, 181
 Tincture aconite, 58, 181
 arnica flowers, 181
 belladonna leaves, 74
 digitalis, 60
 hydrastis, 181
 hyoscyamus, 181
 iron chloride, 48, 181
 nux vomica, 66, 181
 pulsatilla, 181
 stramonium, 182
 strophanthus, 63, 182
 veratrum viride, 182
 Trikresol, 182
 Trional, 97, 182
 Triticum, 182

 Urethane, 182
 Urotropin, 101

 Valerian, 182
 Veratrum viride, 59, 183
 Veronal, 97, 183
 Viburnum compound, 183
 prunifolium, 183

 Weights and measures, 12
 apothecaries', 12
 metric, 14
 White precipitate, 183
 Wild cherry bark, 183

 Zinc carbonate, 183
 chloride, 183
 oxide, 184
 phosphide, 184
 stearate, 184
 sulphate, 184
 sulphocarbonate, 184
 valerianate, 184

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